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DSH ABSTRACTS

Volume 1

JANUARY, 1961

Number 2

CONTENTS	Abstracts	Page
HEARING	337 - 371	107
Anatomy and Physiology.....	337 - 349	107
Apparatus and Equipment	350	110
Auditory Skills.....	351 - 353	110
Psycho-Acoustics	354 - 371	111
HEARING DISORDERS	372 - 531	114
Audiometry	372 - 402	114
Auditory Training.....	403 - 405	122
Diagnosis and Appraisal.....	406 - 411	123
Education	412 - 441	125
Etiology and Pathology.....	442 - 487	133
Hearing Aids.....	488 - 495	143
Language and Communication.....	496 - 508	145
Multiple Handicaps.....	509 - 511	149
Psycho-Educational Factors.....	512 - 520	150
Social and Legal Factors.....	521 - 526	152
Vocational Training and Adjustment.....	527 - 531	153
SPEECH	532 - 596	155
Acoustics	532 - 533	155
Anatomy and Physiology.....	534 - 549	155
Auditory Feedback.....	550 - 551	159
Communication Theory.....	552 - 553	159
Intelligibility	554 - 560	160
Phonetics	561 - 579	161
Semantics	580 - 581	165
Speech and Language Development.....	582 - 593	166
Voice	594 - 596	168
SPEECH DISORDERS	597 - 665	169
Aphasia	597 - 607	169
Articulation Disorders.....	608	172
Cerebral Palsy.....	609 - 619	172
Cleft Palate.....	620 - 639	175
Delayed Speech.....	640	180
Laryngectomy	641 - 647	180
Stuttering	648 - 655	181
Voice Disorders.....	656 - 665	183
GENERAL	666 - 695	185
SOURCES OF ABSTRACTS		192
AUTHOR INDEX		197

DSH ABSTRACTS

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DSH ABSTRACTS

HEARING

ANATOMY AND PHYSIOLOGY

337. DOHLMAN, G., Modern views on vestibular physiology. *J. Laryngol. Otol.*, London, 73, 1959, 154-160.

If radioactive sulphur, S^{35} , is injected s.c., the labelled sulphur will be found for certain periods of time practically everywhere where sulphur in any compounds takes part in the metabolism of the tissues or fluids of the body. After injecting S^{35} into pigeons which were killed after from one to 24 hr. it was possible to demonstrate the radioactivity of the labelled sulphur in the labyrinth. After the preparation of microscopic sections, these were covered with a layer of photographic film emulsion which was then exposed for two to six weeks to the radioactivity in the sections. The results make it apparent that the epithelium of the planum semilunatum, which embraces and encircles the cupular structures, is a secretory epithelium and that the compounds which are secreted are sulpho-mucopolysaccharides. The fact that these compounds are substances with highly negatively charged molecules, and that they are secreted directly into the cupula, leads the author to think that they are of the greatest importance for the function of the cupula. The transformation of mechanical movements to electrical charges is the fundamental potential change, influencing the generation of excitatory reactions in the nerve endings of the cristae. The author proposes to abandon the traditional conception of the action of the cupula causing a bending of the hairs of the hair cells as the relevant effect of an endolymph movement. On the other hand the presence of mucopolysaccharides absorbed into the cupula, as was shown in these experiments, might suggest reversible electrical changes due to flow potentials, known to exist under similar conditions in the meshwork of the cupula, which might be collected by the hairs, acting as antennae for the hair cells, thereby raising or lowering their cell potential. Such variation in the cell potential of the sensory cells is known to influence the nerve endings surrounding these cells. The

author showed the presence of a cholinesterase activity in the sense organs of the vestibular apparatus by the sedimentation of copper sulphate after Koelle. As a result of these experiments it is possible to state that a system of efferent nerve fibers, of a cholinergic type, pass to and end in the sense organs of the vestibular apparatus. The origin and pathways of these efferent fibers are unknown as is also their physiological function. This efferent system might be connected in some way with a mechanism for the regulation of the activity of the sensory nerve fibers in the vestibular system. (*Excerpta Medica*, XI)

338. FERNANDEZ, C., Innervation of the cochlea in relation to hearing loss. *Laryngoscope*, 70, 1960, 363-372.

The mammalian cochlea is innervated by three systems of fibers, i.e., autonomic, efferent, and afferent. There is little evidence that imbalance of the autonomic nervous system produces vascular disorders resulting in hearing loss. The theory of vasospasm as a manifestation of autonomic imbalance requires a thorough investigation. The information about the efferent system is still fragmentary. It is not known whether and how disorders of this system affect hearing function. The significance of multiple innervation in the cochlea is unknown; however, for coding auditory signals of simple nature, such as pure tones at threshold, it is not necessary. Several observations in man and animals revealed that a large reduction of nerve population is compatible with thresholds within normal limits. On the other hand, coding of complex auditory signals such as loudness function and speech, requires integrity of cochlear innervation. A typical example is absence of loudness recruitment and severe loss of auditory discrimination associated with an acoustic neuroma. (*Author's summary*)

339. GISSELSSON, I. and SÖRENSEN, H., Auditory adaptation and fatigue in cochlear potentials. *Acta oto-laryngol.*, Stockholm, 50, 1959, 391-405.

No fatigue could be demonstrated by exposing guinea-pig ear to short pure tones

(one sec.) under 95 db intensity. Longer stimulation with increasing intensities up to 130 db produced a clear decrease in the amplitude of the cochlear potentials. The recovery time after high-intensity stimulation for less than one minute was from one to five min; it increased with increasing stimulus duration. The effect seemed to be independent of the frequency of the stimulating tones (500, 1000 and 2000 cps). Stimulation with white noise (130 db) particularly affected low frequency recovery. Noise containing frequencies 5000-20,000 cps depressed cochlear potentials more than white noise of the same intensity. (*Excerpta Medica*, XI)

340. IVANOV, N. I., Gistologichkie izmeneniia vo vnutrennem ukhie zhivotnykh, podvergnutykh rentgenovskomu obлучeniui. (Histological changes in the inner ear of animals after exposure to X-ray irradiation.) *Vest. Oto-Rino-Laringol.*, Moscow, 19, 1958, 78-83.

General and localized X-ray irradiation in amounts from 300-600 and 1000-2000 roentgens respectively, were applied to rabbits and guinea pigs. Atrophy and degeneration of the organ of Corti, hemorrhage of the inner and middle ear, exudate, and other changes in the cochlea were reported with slight change in the cellular elements of the nervous system. In one human patient, high tone hearing loss is reported after several years of direct radiation exposure. (*Psychol. Abst.*)

341. KIETZ, H., Das Verhalten der Membrana tectoria bei Erregung unseres Ohres mit Dauertönen. (The reaction of the tectorial membrane to continuous tone stimulation.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(9), 1960, 549-556.

A pendulum model is again used to simulate vibrations in the inner ear. Continuous stimulation with a tone of, say 200 cps at 80 db forces the basilar membrane to vibrate at that frequency. The tectorial membrane, however, cannot follow suit, is pushed aside and vibrates irregularly around its new position. The irregular vibrations of the tectorial membrane may explain the irregularity in size and timing of the nervous impulses resulting from continuous tone stimulation. It may also explain why tones of very low frequency when applied con-

tinuously fail to result in directional hearing. (*Author's summary*)

342. LEGOUX, J. P., Etude expérimentale du mécanisme de la conduction osseuse dans les cas de surdité de transmission. (Experimental study of the mechanism of bone conduction in cases of conduction deafness.) *Ann. Oto-Laryngol.*, Paris, 76 (10-11) 1959, 930-936.

The study of microphonic response of the rabbit cochlea to stimulations by the osseous route made it possible to demonstrate alterations during manipulations of the middle ear. These alterations consisted in changes in the amplitude and phase of the response. They seem to prove the participation of two mechanisms of bone conduction: the mechanism of inertia and the mechanism of compression. The mechanism of inertia is believed to comprise two components, one due to movements of the ossicles and the other due to movement of the labyrinthine fluids. These two components combine according to their amplitude and phase. The variations in phase supply physiological explanations for certain phenomena that may be observed in clinical practice with reference to bone conduction. In particular, the lateralization which is observed in the Weber test in cases of conduction deafness is held to be due to an advance of the phase of response of the side affected. (*Excerpta Medica*, XI)

343. LEGOUX, J. P., L'exploration électro-physiologique de la cochlée et les théories de l'audition. (Electrophysiological exploration of the cochlea and theories of audition.) *Psychol. Franc.*, 4, 1959, 35-42.

Recent studies of the auditory mechanism have given us much assistance in our understanding of this process. We must continue to emphasize the total process from the receptor level through to the cortical level if we are to thoroughly understand the hearing mechanism. (*Psychol. Abst.*)

344. MacCLURE, J. S. R., La investigación en la función de la corteza auditiva. (Investigation of the function of the auditory cortex.) *Rev. Otorrinolaringol.*, Santiago, 20(1), 1960, 19-26.

In order to answer the question about hearing loss in lesions of the auditory cortex, a review of the recent literature has

been made. Both experimental and clinical investigation seem to point out that elementary hearing is not disturbed by cortical lesions. On the other hand, it seems that the auditory cortex should be intact for synthetic hearing or 'difficult discrimination.' With the purpose of assessing the hearing disorders of central origin, a number of clinical tests have been proposed. They are based mainly on distorted speech (limiting frequency range, accelerating, interrupting, long sentences, alteration of rhythm). It has been verified that the articulation score for difficult discrimination is definitely lower in the ear contralateral to the damaged temporal lobe although similar deficiencies have been found in cases of acoustic neurinoma, brain stem lesions, and presbycusis. From a strict scientific point of view, there is still skepticism regarding the diagnostic value of the new methods. In the first place, the understanding of the role of the total auditory region in sensory discrimination is insufficient, and in the second place, 'the exact locus and extension of the lesion produced by accident, disease or surgery can seldom be determined by post-mortem examination.' Experimental research in animals has shown that 'the auditory cortex is not a unitary region, whether considered from the standpoint of its structural relationships or its function.' Clinical research has shown that the intelligibility of the so-called 'difficult speech' is decreased in lesions involving the central auditory neurons or the auditory cortex, but still the author is uncertain about the meaning of the type of hearing loss in relation to the site of the damage. (*Author's summary*)

345. MEHMKE, S., Hörverbessernde massnahmen am spannungsveränderten trommelfell. Klinische beobachtungen und experimentelle untersuchungen. (Measures improving hearing in changes of the tension of the drum. Clinical observations and experimental studies.) *H.N.O.*, Berlin, 7, 1959, 296-301.

Studies were carried out on the conditions of generation of sound in air in changes of the tension of the drum in partial or complete loss of the sound pressure transformation in the membrane of the round window. Detailed data are given on the method of the experiments, which were carried out in fresh preparations of the

human petrous bone and demonstrated the importance of a phase shift for the generation of sound in air. For the details the article should be studied. (*Excerpta Medica*, XI)

346. MEYER, M. F., Working model illustrating the cross section of the cochlea mechanically. *J. acoust. Soc. Amer.*, 32, 1960, 1158-1159.

This model serves a totally different purpose from that which shows through transparent windows what goes on *lengthwise* in the cochlea. . . The presently described model shows what hypothetically happens *crosswise*. It is made of dry ties of several materials, not of tubing filled with a liquid. (*Author's précis*)

347. SIMMONS, F. B., GALAMBOS, R., and RUPERT, A., Conditioned response of middle ear muscles. *Amer. J. Physiol.*, 197(3), 1959, 537-538.

Simple and differentially conditioned responses of the middle ear muscles to visual stimuli were produced in awake cats with electrodes implanted chronically on the round windows. Muscle contractions were observed indirectly through their effects on the cochlear microphonic. These CRs are easily produced and have very short latencies (80 msec) under optimal conditions. Somewhat longer minimal latencies (150 msec) were measured in the differential learning situation. The stapedius was shown to play the dominant role in those conditioning experiments where only one of the two middle ear muscles was left intact. (*Excerpta Medica*, XI)

348. SØRENSEN, H., Auditory adaptation in nerve action potentials. Recorded from the cochlea in guinea pigs. *Acta otolaryngol.*, Stockholm, 50, 1959, 438-450.

Urethan-anaesthetized guinea pigs were exposed to noise and pure-tone stimulation of low intensity (35-80 db). The effect of the exposure was measured on neural click responses recorded with gross electrodes from the basal turn of the cochlea. A depression of the neural activity, evidenced by a reduction of the amplitude of the click response, was demonstrated when the clicks were masked by white noise of moderate intensity. The site and mechanism of the depression are discussed. The fact that the

effect could not be produced by stimulation of the contralateral ear excludes central inhibition and indicates a peripheral action. Possible sites are: (1) The cochlea microphonic generators. (2) The auditory nerve potential generators. Cogent reasons are given for choosing the second alternative. Other possibilities rejected are: (3) The stapedius. (4) A hypothetical intermediary link possibly of a chemical nature between microphonic and auditory nerve. With obvious reservation it is suggested that this electrophysiological phenomenon in the anaesthetized guinea pig may be correlated with the threshold shift that occurs in man after low intensity stimulation, i.e., auditory adaptation. (*Excerpta Medica*, XI)

349. THOMPSON, R. F., Function of auditory cortex of cat in frequency discrimination. *J. Neurophysiol.*, 23, 1960, 321-334.

Evidence relative to the effect of large ablations of auditory cortex on frequency discrimination is contradictory. Two experiments are described in which the work of previous investigators is tested. Auditory frequency discrimination in cat after removal of all known auditory cortex was studied. In Experiment I, where no relearning occurred after lesion and where relearning with normal thresholds occurred after lesion were compared. It was found that training procedure was the critical variable. In Experiment II, the role of training procedure was analyzed. The same group of animals both could and could not discriminate frequency following lesion, depending upon conditions of training. If response to change from constant background stimulation was required, frequency discrimination was rapidly relearned. However, if the animals were required to respond to one stimulus complex and withhold response to another, relearning did not occur, response continuing to both sets of stimuli. If counterpunishment for response to the negative stimuli was introduced, response to both sets of stimuli declined to a low level. Thus, removal of auditory cortex appears to interfere with the ability to inhibit response to negative stimuli in frequency discrimination, rather than to interfere with frequency discrimination as such. (*M.N.*)

APPARATUS AND EQUIPMENT

350. COX, J. R., Jr., and BILGER, R. C., Suggestion relative to the standardization of loudness-balance data for the telephonics TDH-39 earphone. *J. acoust. Soc. Amer.*, 32, 1960, 1081-1082.

This new earphone which is being supplied with most current American audiometers has apparently not been subjected to the extensive calibration typical of the previous prevalent types of earphones. The present authors, on the basis of experimental loudness-balance data, accept the published calibration for frequencies up to 4000 cps, but suggest that their new data be used for the higher frequencies. Figures are given. (*B.A.L.*)

AUDITORY SKILLS

351. ROUSEY, C. L., GOETZINGER, C. P., and DIRKS, D., Sound localization ability of normal, stuttering, neurotic, and hemiplegic subjects. *Amer. Arch. gen. Psychiat.*, 1, 1959, 640-645.

In this study, 67 subjects—20 stuttering children, 20 normal children, 20 emotionally disturbed children, and 7 hemiplegic children—were tested for their ability to localize sound. In general, it was found that there was a marked inconsistency in their response pattern, although normal children were the least inconsistent. Further, it was noted that in terms of frequency of responses to binaural stimuli, stutterers tended to give more displaced responses, normal children, more head responses, and neurotic children, more ear responses. Under monaural stimuli, the major difference in the four groups was in the greater number of displaced responses found among the stutterers. However, all groups tended to show some variance in responses—sometimes suggesting they heard it in the head, sometimes in the ears, and sometimes outside the head. The results in general suggest the need for extensive reevaluation of our earlier concepts regarding localization and of their possible neurological implications. (*Author's Summary*)

352. SAKURABAYASHI, H., SATO, Y., and UEHARA, E., Mōjin no chōkaku benbetsu-ryoku ni kansuru Kenkyū. (Auditory discrimination of the blind.) *J. Psychol. Blind*, 1, 1956, 3-10.

By means of the Seashore Measure of Musical Talent Test, discriminations of pitch, loudness, rhythm, duration, timbre, and tonal memory were tested. Two hundred eighty-two normals, 148 normal students in music, 150 blinds, and 17 blind students in music were used as the subjects. It was expected that if there is a compensatory mechanism between senses, blinds will show higher auditory sensitivity than normals. In general, music specializing students showed distinctively high sensitivity. But there was no clear difference between normal and blind subjects. (*Psychol. Abst.*)

353. TAYLOR, I. G., Localization of sound stimuli. *Speech Pathol. Ther.*, London, 1, 1958, 66-69.

The author traces the development of sound localization in infants apparently based upon his clinical observations. He notes that the development coincided with experience and maturation, particularly stressing the upright posture and spatial orientation linkage. The mentally deficient child will respond up to his mental age. If no hearing loss exists, the emotionally disturbed child is capable of normal localization. Even partial deafness is a deterrent towards normal localization, resulting in a seeking response. Localization is dependent upon binaural hearing and must be shown to have been developed before it is possible to establish normal auditory function in babies. (*Excerpta Medica*, XI)

PSYCHO-ACOUSTICS

354. BEER, B., and VALENSTEIN, E. S., Discrimination of tones during reinforcing brain stimulation. *Science*, 132 (3422), 1960, 297-298.

Hungry albino rats were trained to press a lever for brain stimulation. Two different tones were presented concurrently with the stimulation. The results demonstrated not only that the animals were capable of distinguishing between the two tones during intracranial stimulation, but also, under certain circumstances, were capable of terminating self-stimulation to respond to other reinforcements. (*F.R.*)

355. CHOCHOLLE, R., Problèmes psychophysiolgiques relatifs aux bruits. (Psychophysiological problems relative to noises.) *Psychol. Franc.*, 3, 1958, 266-276.

Problems related to noise and the need for legislative controls are discussed. Included are: the problem of definition; methods of measurement; effects of noise on the hearing mechanism and other sensory mechanisms; general psychological and physiological effects; and the specialized effects of high frequencies, vibrations, and shock waves. (*Psychol. Abst.*)

356. CRAIG, J. H., and JEFFRESS, L. A., Why Helmholtz couldn't hear monaural phase effects. *J. acoust. Soc. Amer.*, 32, 1960, 884-885.

The authors agree with previous authors that Helmholtz could not hear the monaural quality effects of phase differences because his instrumentation was too unwieldy. Whereas Helmholtz needed a few seconds to re-set his apparatus, the current authors find that the interstimulus interval must be less than one second to produce the required effects. (*B.A.L.*)

357. CREELMAN, C. D., Detection of signals of uncertain frequency. *J. acoust. Soc. Amer.*, 32, 1960, 805-810.

Theoretical models for frequency sensitivity in human observers are discussed. One decision procedure for a multiple-filter model is considered in some detail as a general model for decision situations in which each available response is tied to more than one of the possible signal alternatives. Two experiments were conducted in an attempt to choose between a sweeping-filter model and a multiple-filter model. Detection in a two-alternative forced-choice experiment in which the signal could be one of two possible signals was measured over a range of frequency separations. The data yield further support for a multiple-filter model. (*Author's précis*)

358. DURLACH, N. I., Note on the equalization and cancellation theory of binaural masking level differences. *J. acoust. Soc. Amer.*, 32 1960, 1075-1076.

This note provides a brief introduction to a quantitative theory of binaural masking level differences. A model is proposed for the operations performed by the brain on the received signals and this model is applied to some experimental data. (*Author's précis*)

359. EIJKMAN, E., and VENDRIK, A. J. H., Dynamics of the vibration sense at low frequency. *J. acoust. Soc. Amer.*, 32, 1960, 1134-1139.

The dynamic properties of the vibration sense in the human skin were investigated by means of psychophysical methods using stimuli with different time courses. Sinusoidal deformations and deformations linearly increasing with time were used. Up to frequencies of 30 cps the results are described very well by a differentiating system having a time constant of about 30 msec. This is in good agreement with electrophysiological observations. Also in agreement with electrophysiological experiments, 'rectifying' properties are found. Possible mechanisms underlying these phenomena are discussed. (*Author's précis*)

360. EISLER, H., and EKMAN, G., A mechanism of subjective similarity. *Nord. Psykol.*, 11, 1959, 1-10.

The mechanism of perception of similarity in the dimension of pitch was investigated, and similarity estimates were obtained from which a pitch scale was constructed. It was found that subjective similarity between two tones of equal loudness is equal to the ratio between the lower pitch and the average of the two pitch values. This relationship is in general agreement with Helson's concept of adaptation level (and Fechner's law). In this experiment similarity is defined as the arithmetic mean of the subjective values of the two stimuli presented. (*Psychol. Abst.*)

361. EK, J., JONGKEES, L. B. W., and KLIJN, J., The threshold of the vestibular organ. *Acta oto-laryngol.*, Stockholm, 50, 1959, 292-300.

Measurements of the threshold of the canal system in pigeons have shown that a 'threshold' is discussed. For a vestibular or of the effect of the signal in the background variations (noise). In the noise zone it is possible by noise reduction and by statistical means to find the influence of much smaller stimulations (in personal measurements down to 0.04/sec.). The value of the idea 'threshold' is discussed. For a vestibular organ a physiological threshold—the strength of a stimulation which causes a clear reaction while all smaller stimulations have no effect at all—does not exist. Before it is

reached the background variations cover all responses. A physical threshold is measurable as a result of the noise but does not inform us about the normal action of the organ. The authors purpose to introduce the name psychological threshold, given by the character of the observer and defined by the amount of certainty he requires to distinguish a signal from the ambient noise. This psychological threshold reflects the drowning of the signal in the noise via the mind of the observer, and is the threshold found in practice. (*Excerpta Medica*, XI)

362. HARRIS, G. G., Binaural interactions of impulsive stimuli and pure tones. *J. acoust. Soc. Amer.*, 32, 1960, 685-692.

The slope of the time-vs-intensity trade is different for low-frequency impulsive stimuli and for high-frequency impulsive stimuli. The interaural intensity difference for high-frequency impulsive stimuli significantly alters the effective binaural time difference. Thus, for these stimuli, the time-vs-intensity trade is important for binaural localization. Interaural intensity difference also affects the ability to lateralize. The error in lateralization is least when the interaural intensity difference and interaural time difference are zero. The timing information used in binaural lateralization travels along frequency-dependent neural pathways, and any physiological timing signal must be able to explain this phenomenon. (*Author's précis*)

363. LOEB, M., and RIOPELLE, A. J., Influence of loud contralateral stimulation on the threshold and perceived loudness of low-frequency tones. *J. acoust. Soc. Amer.*, 32, 1960, 602-610.

Two experiments, employing different psychophysical procedures, were performed to measure the attenuation at intensities near the threshold due to the acoustic reflex. In both, a contralateral tone was introduced to activate a reflex and the resultant threshold shift for a test tone noted. Shifts observed were small and apparently inconsistent with findings of past experiments. Possible significance of the results was discussed. (*Author's précis*)

364. MEYER, M. F., Does the hypothesis of the hydraulic functioning of the cochlea bear on the definition of masking? *J. acoust. Soc. Amer.*, 32, 1960, 1076-1078.

Application of the theory of hydraulic functioning of the cochlea leads to a distinction between action of a tone upon another tone and action of a noise upon a tone, and confirms the demand for a redefinition of masking. (*Author's précis*)

365. ORSINI, F., *Étude expérimentale des conduites temporelles. Effet de l'apprentissage sur la reproduction d'une durée chez l'enfant et chez l'adulte.* (Experimental study of temporal behavior. Effect of learning on the reproduction of an interval in children and adults.) *Ann. psychol.*, 58, 1958, 339-345.

In learning to evaluate sound duration, 30 children aged 7 and 30 adults aged 35-45 years were used to test the hypothesis: after prolonged learning of sound duration, differences in estimation between children and adults will disappear. Result: children reach the same degree of precision. Are the underlying mechanisms in both groups the same? Such learning in children anticipates genetic evolution. (*Psychol. Abst.*)

366. PERELLÓ, J., *La integración mental en la audición.* (Mental integration in audition.) *An. Med., Espec.*, 45(1), 1959, 78-80.

Audition, as an over-all informative process, comprises a physical process and a psychological elaboration. The ear picks up and recognizes some phonemes and the higher auditory centers fill up the gaps existing between them and complete the phrase heard. The author proposes a test for measuring this psychological elaboration. The test is as follows. The examiner writes down a simple phrase on the abscissae. The test subject is then asked to guess it, not in a general manner but by spelling the phonemes successively. The number of tests which he must do in order to find the correct phoneme is noted down on the ordinate. The percentage of phonemes guessed right may express the mental integration. (*Excerpta Medica*, XI)

367. PIKLER, A. G., and HARRIS, J. D., *Compensatory and pursuit tracking of loudness.* *J. acoust. Soc. Amer.*, 32, 1960, 1129-1133.

In the compensatory form of loudness tracking, the subject keeps a loudness level constant in the face of programmed

changes; in the pursuit form, he duplicates the loudness changes by manipulating an external source. Five subjects were required to track three tape-recorded programs presented in eight test conditions, including both modes (compensatory and pursuit) and three channel types of reception (monotic, diotic, dichotic). The responses were obtained by dial-writing techniques and a paper-tape voltage recorder. Analysis of variances based on 120 tracings revealed the overall superiority of the compensatory mode (averaged momentary error 2.2 db) vs the pursuit mode (3.3 db). High accuracy and consistency obtainable in auditory tracking suggest its use for the purposes of suprathreshold audiometry and for human engineering tasks in compensatory and pursuit displays. (*Authors' précis*)

368. POLLACK, I., *Temporal sampling parameters of interaural noise correlations.* *J. acoust. Soc. Amer.*, 32, 1960, 795-799.

The minimal interaural noise correlation discriminable by trained listeners was examined as a function of temporal sampling parameters of the noise. The prime determinant of the listeners' performance is the total integrated duration of the noise samples, irrespective of the other temporal parameters. Within the restriction of a constant integrated duration, superior performance is attained with an interval of about two msec between successive brief noise samples. (*Author's précis*)

369. SCHAEFER, E., *Die Ermüdungsgrenze des Ohres.* (The fatigue threshold of the ear.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(9), 1960, 556-565.

Methods of measuring the fleeting 'momentary threshold' of hearing after exposure to noise are described. The results of tests on eight experienced subjects and involving 360 tests of an hour's duration are discussed. An even distribution of fatigue was found with small sound pressures along the whole scale of frequencies, later with a special weak area at four kcps. The influence of amplitude was progressive, that of duration retrogressive. Recovery occurred constantly in the ears tested, at first very rapidly, later more slowly, and was complete within seconds or minutes. The limits of fatigue were determined by the dependent readaptation and three other criteria,

summarized in an amplitude-time diagram. It is emphasized that by measuring the sensitivity to noise it should be possible to avoid early acoustic trauma. Finally human and animal experiments are quoted from the literature from which it is possible to obtain rough figures of conditions leading to damage and destruction of hearing. (*Author's summary*)

370. TANNER, W. P., Jr., Theory of signal detectability as an interpretive tool for psychophysical data. *J. acoust. Soc. Amer.*, 32, 1960, 1140-1147.

The theory of signal detectability is examined from the standpoint of determining a set of satisfactory assumptions for the purpose of developing an interpretive tool for use in psychophysical experiments. It is concluded that the assumption that the observer attempts to maximize the expected value of the outcome of the experiments is satisfactory for this purpose, and that a set of physical conditions can be established which justify a computation of the detectability of a signal in noise based on a finite sampling plan involving $2WT$ amplitude values over the open interval 0 to T . (*Author's précis*)

371. ZWISLOCKI, J., Theory of temporal auditory summation. *J. acoust. Soc. Amer.*, 32, 1960, 1046-1060.

A theory of temporal auditory summation is developed and applied to the threshold of audibility for various temporal patterns of pulses and sinusoidal vibrations. The theory is based on the assumption of an exponential decay of neural excitation and, for the threshold of audibility, it includes only one time constant. Various factors that may affect temporal auditory summation are discussed. It is shown that the same theory applies to muscle contractions. (*Author's précis*)

HEARING DISORDERS

AUDIOMETRY

372. ADES, H. W., MORRILL, S. N., GRAYBIEL, A., and TOLHURST, C. G., Threshold of aural pain to high intensity sound. *Aerospace Med.*, 30(9), 1959, 678-684.

Deaf and normal human subjects were exposed monaurally to high intensity noise

stimuli including pure tone and broad band noise. There was considerable individual variation, but in general, thresholds for deaf subjects were slightly higher than for normals. Possible explanations for this difference are discussed. (*Excerpta Medica*, XI)

373. BOMBELLI, U., and MANFREDI, A., Rilievi willismetrici in prove audiologiche con la voce parlata. (Vocal audiometric results of paracousis willisii.) *Riv. Audiol. prat.*, Milan, 9(4-5-6), 1959, 45-59.

The authors describe a method of revealing and measuring the Willis paracousia. It consists of tracing the vocal audiometric curve firstly in silent and subsequently in noisy surroundings. The interval between the two curves expressed in db is measured at the lowest level of the maximum intelligibility. For this purpose a white noise has been adopted, i.e., a complex tone with a fundamental of 100 Hz at 80 phon. The authors found that, the acoustic pressure being equal, the white noise produces in willismetry much more noticeable results than complex tones. This fact is explained in detail. The vocal willismetric index is then defined and its behavior will form the subject of later studies. Vocal willismetry has shown itself to be a very sensitive test and its index as compared to that of the normally hearing subject, results shortened, annulled or inverted in sufferers from otosclerosis or other conditions where the foot-plate is fixed in the oval window. (*Excerpta Medica*, XI)

374. BROCKMAN, S. J., and HOVERSTEN, G. H., Pseudo neural hypacusis in children. *Laryngoscope*, 70, 1960, 825-839.

Non-organic hearing problems in children are illustrated by case reports on four children, and by the tests used to evaluate their hearing. Audiometric criteria for initial screening of such children from those with organic auditory impairment are: (1) discrepancy between speech and pure-tone thresholds, (2) discrepancy between admitted thresholds and ordinary conversational ability, and (3) inconsistent and variable responses during measurement of pure-tone thresholds. Starting levels for threshold measurement should be 30 db or less when there is a suspicion of better

hearing than the child claims to have. Half-word responses (e.g., 'cow' for 'cowboy') and rhyming words (e.g., 'fire' for 'wire') can be signs of deliberate feigning of hearing difficulty. Estimation of actual threshold can often be derived from responses to informal conversation or to instructions given through the same electroacoustic system used for measuring speech thresholds. (R.G.)

375. BRUTTEN, M., Some problems relating to differential diagnosis of auditory disorders in children. *Proceedings Conv. Amer. Inst. Deaf*, 1959, 37-43.

The existence of great variability in deaf children is pointed out. It is the responsibility of the educator to be aware of these differences as they are revealed by major university centers and by research. It is brought out that years ago mental deficiency was seen as a unitary problem which it is not. By the same token audiological problems have many facets some of which are yet to be understood. A diagnostic evaluation must be intensive and multidimensional, but even so may not differentiate the conditions for which the educator must plan. Among other problems faced is that of determining what portions of the auditory mechanisms are involved in so-called peripheral deafness and where the lesions occur that give rise to central language disorder. It is pointed out that though schools for the deaf have been reluctant to take children with normal auditory end organs, historically they have always been called on to educate the child with major language handicaps. Myklebust is cited as an authority who hopes schools for the deaf will broaden their scope of responsibility and include multiply handicapped and language defective children. (M.C.V.)

376. CHOCHOLLE, R., A propos des seuils de conduction osseuse en présence de différences de sensibilité importantes entre les deux oreilles. (The bone conduction threshold in cases with considerable difference in sensitivity between the two ears.) *Ann. Oto-Laryngol.*, Paris, 76(1-2), 1959, 76-81.

The method proposed by Rainville for determination of the inferior bone conduction threshold does not use elimination

of the contralateral ear, but makes use of the masking of a pure tone through a noise. After determination of the pure tone threshold for air conduction, the masking noise is adjusted to that intensity which just masks, i.e., covers, tone sensitivity. The noise is first applied by air conduction through head-phones and, subsequently, by bone conduction via vibrators. The difference between the two masking values (which may also be negative) is deducted from the pure tone threshold for air conduction measured and the outcome is the inferior bone conduction threshold. The results of the method are the more accurate, the more narrowly the range of noise frequencies used has been centered around the tone frequency; according to Rainville, however, even when a white noise is used the measurements are sufficiently accurate. In cases with a very steep curve of the audiogram, and where the curves of air and bone conduction show no parallelism at all, the use of white noise may have an unfavorable influence on the accuracy of the measurement. Also, the masking noise, conducted from the vibrator via the bone to the cochlea also influences the ear that is not being examined, and this may also make the findings more difficult to interpret. In spite of these disadvantages, however, the method of Rainville may be regarded as a valuable contribution to the solution of this problem. Another procedure has been proposed by Suzuki and Ichihawa: a tone 5 db over the auditory threshold is applied via air conduction and a vibrator connected with the same ear gives off a tone which differs from it by only a few cps. The patient is asked to state at which intensity of the bone tone he experiences maximal interference. As at this moment the sound energy arriving at the cochlea is about the same via the bone and via the air, the bone tone value of the auditory threshold corresponds to +5 to +10 db. Use of greater sound intensities, e.g., 15-20 db above the threshold, may render the examination easier in practice. It is also proposed, by a frequency difference of 100-200 cps, to evoke a different tone, which occasionally is easier to perceive than the interference. In the author's opinion, decreased bone conduction does not unconditionally mean

a lesion in the nervous portion of the auditory apparatus; when the cochlear fenestrae have been completely closed off by an otosclerotic process, the bone conduction curves are abnormal even when the internal ear is intact. (*Excerpta Medica*, XI)

377. CHOCHOLLE, R., Some recent experiments on the cortical and infracortical elements of the auditory threshold, both absolute and differential. *Trans. Beltone Inst. hearing Res.*, (13) 1960. A translation of "Quelques experiences recentes sur les elements corticaux et infracorticaux du seuil auditif, tant absolu que differentiel," *Pathologie et Biologie*, 6, 1958, 719-730.

It is well known that certain apparently nonauditory factors, such as mental fatigue, can influence auditory threshold. In order to throw some additional light on this, a series of experiments was performed by the author over a period of years. Using the method of constant stimuli, with modifications, absolute monaural and binaural thresholds of subjects were compared. Additional experiments were performed on the differential threshold of intensity, with and without a constant tone of the same frequency in the opposite ear. Results point to the fact that the mechanism of hearing peripherally cannot account for the data obtained, and that superior levels of the sensory circuit must influence the perception of threshold tones, whether absolute or differential. (*B.A.L.*)

378. De SEBASTIAN, G., Los umbrales supraliminares. (The suprathreshold curves.) *Fono Audiologica*, Buenos Aires, 6, 1960, 48-51.

Defining as the comfortable intensity level, that level at which one might like to listen to music, the author draws comfort level curves for 200, 500, 1000, 3000, and 4000 cps. On the same audiogram he records the subject's threshold of discomfort. He points out that patients lacking recruitment do not show a discomfort curve since it is above (or below) the scope of the chart. When the comfort curve falls within 20 db of the discomfort curve there is evidence of recruitment. The author recommends this as a useful test technique when equipment is limited and ambient noise levels are too high for

accurate pure tone reception threshold determination. (*M.S.W.*)

379. DUDOK, DE WIT, C. A., and SCHUTH, D. M. H., Perception deafness in otosclerosis. *Pract. Oto-Rhino-Laryngol.*, Basel, 22(5), 1960, 448.

The bone conduction audiogram of otosclerosis patients is diminished by three factors: the Carhart Notch, presbycusis, and the damage caused by otosclerotic foci. A random sample of 150 patients was divided into three age-groups. In the mean bone and air conduction audiograms of these groups the spread was considerable. However, after correction for presbycusis and the Carhart Notch in the speech range, identical audiograms resulted for all age-groups. In 93% the perception loss attributed to otosclerosis proved to be less than 10 db and only in seven percent 10-20 db and higher. However, probably the actual loss is higher because presbycusis and otosclerotic perception deafness may overlap. (*Authors' summary*)

380. FARRANT, R. H., The audiometric testing of children in schools and kindergartens. *J. aud. Res.*, 1, 1960, 1-24.

Using a specially constructed battery-powered pure-tone audiometer in surveying the hearing of school children, the author makes the following conclusions: (1) screening audiometry can be effectively carried out using tones of 500 cps and 4000 cps only at a hearing level of 15 db in low ambient noise; (2) incidences of measurable hearing defects can be expected on the order of about 5% of ears or 3% of children audiometrically screened; and (3) most losses found were monaural, slight to moderate in extent, conductive in nature, with only 0.23% of those tested showing a significant binaural loss. Further general recommendations are made regarding techniques and planning for large-scale screening audiometry. (*P.A.Y.*)

381. GOLDSTEIN, R., and KRAMER, J. C., Factors affecting thresholds for short tones. *J. speech hearing Res.*, 3, 1960, 249-256.

Psychophysical thresholds for tones of various durations were determined on 48 normal adults. The stimuli were bursts of 1000-cps tones with 7.5-msec rise and fall

time. Durations measured from onset to off of the tones were: 2000, 400, 200, 100, 50 and 20 msec. Overall there was the expected approximately linear 'trading' relation between time and intensity as duration increased from 20 to 200 msec. Thresholds continued to get lower, although at a slower rate, for durations longer than 200 msec. The intensity-duration curve was steeper for women than for men. Women had lower thresholds at 2000 msec, and men lower thresholds at 20 msec. There were no significant differences for the intermediate durations. The subjects 40 years old and older had 2.5 to 3.0 db higher thresholds than the subjects less than 40 years old at all durations. (*Authors' summary*)

382. HINCHLIFFE, R., The threshold of hearing of a random sample rural population. *Acta oto-laryngol.*, Stockholm, 50(5), 1959, 411-422.

The threshold of hearing by earphone listening was determined on random sample rural populations of both males and females in the age group 18-24 yr. A clinical audiometer equipped with earphones differing from the pattern used to establish the British Standard of the threshold of hearing was employed. After the exclusion of clinically abnormal ears, the thresholds for the two sexes were found to be in agreement, except at the midhigh audio-frequencies, where the threshold of hearing for males was significantly poorer. This impairment of the threshold for males is attributable to permanent noise-induced hearing loss, due primarily to small arms firing. The derived normal threshold of hearing for our random population is in agreement with the British Standard of the thresholds of hearing by earphone listening. (*Excerpta Medica, XIX*)

383. HOOD, J. D., The principles and practice of bone conduction audiometry. *Laryngoscope*, 70, 1960, 1211-1228.

Masking noise for bone conduction audiometry should be limited to the critical band around the frequency of the test tone. When such masking noise is employed the following procedure is useful and valid for measuring bone conduction thresholds in most patients. 1. Establish the air-conduction audiogram of both ears in

the normal way with masking, if necessary, of the untested ear, i.e., when the difference in the hearing loss between the two ears exceeds 50 db. 2. Find the bone-conduction threshold with the bone-conductor applied to the mastoid of the tested ear without masking of the untested ear. 3. Apply the masking noise of the appropriate band to the untested ear by means of an insert receiver and find a bone-conduction threshold reading. 4. Apply the 'shadowing' procedure thus: Increase the level of the masking noise by 10 db above threshold and retest the bone-conduction threshold. If the bone-conduction threshold is raised by 10 db increase the masking intensity by another 10 db and repeat. Continue this procedure until the point is reached at which the bone conduction remains constant with further additional incremental steps of 10 db of the masking noise. This is the 'change-over' point, and gives the true bone-conduction threshold of the tested ear. Subtraction of the 'change-over' point from the air conduction threshold of the tested ear gives the amount of the conductive component (essentially the air-bone gap) of that ear. It is desirable to deliver the masking noise through a rubber-tipped-insert receiver to minimize the transduction of the masking noise to the test ear. (*R.G.*)

384. IODICE, S., Risultati e vantaggi dell'uso di una nuova metodica per la determinazione della fatica uditiva. (The results and advantages of the use of a new method for the determination of auditory fatigue.) *Arch. Ital. Laringol.*, 67(3), 1959, 371-378.

It is admitted that for the determination of auditory fatigue, no wholly satisfactory technique exists. The author proposes, however, a method which consists of parts, as follows: (1) determination of the air and bone thresholds at 1024 and 4096 cps; (2) fatiguing by the two above-mentioned frequencies at 100 db intensity, for five minutes, and determination of the threshold after two minutes' rest; (3) 20 minutes' rest; (4) fatiguing with white noise at 100 db for five minutes; (5) vocal audiometry with logatomes. Using this technique, a study has been made of 40 subjects, subdivided into several groups, of which schematic graphs are presented.

From the findings in general the conclusion is drawn that the method makes it possible to test both the sensitivity to sound trauma and to determine what acoustic sectors are more electively exposed to such trauma. The possibility of determining anatomo-functional sectors that are particularly susceptible to sound trauma renders this method of examination socially interesting as well. (*Excerpta Medica*, XI)

385. JERGER, J. F., Békésy audiometry in analysis of auditory disorders. *J. speech hearing Res.*, 3, 1960, 275-287.

A qualitative analysis of 434 Békésy audiograms suggests that most tracings can be placed into one of four categories. The basis for categorization is the relationship between tracings of periodically interrupted and continuous tonal stimuli. Lesions of the middle ear are characterized by one relationship, lesions of the cochlea by a second, and lesions of the eighth nerve by a third and fourth. (*Author's summary*)

386. JERGER, J. F., Audiological manifestations of lesions in the auditory nervous system. *Laryngoscope*, 70, 1960, 417-425.

Audiometric patterns are contrasted for five categories of anatomic lesions of the auditory system. The findings in each category can be summarized in terms of the tests discussed. *Middle ear* (otosclerosis): sensitivity loss on a conductive basis; normal type Békésy audiogram; normal speech discrimination; no loudness recruitment; and low SISI scores. *Cochlea* (Ménière's disease): moderate sensory-neural sensitivity loss; smaller than normal excursions on the Békésy audiogram with greater sensitivity loss shown at the higher frequencies for continuous than for interrupted tones; speech discrimination poorer than anticipated from audiogram; loudness recruitment; and high SISI scores. *VIIIth nerve* (acoustic neurinoma): small high-frequency sensitivity loss (in example shown); normal excursions on the Békésy audiogram but with a very rapid 'relapse' of tonal sensation, i.e., increase in hearing level, with a continuous tone but not with an interrupted tone; speech discrimination very much poorer than anticipated from audiogram; no loudness recruitment; and low SISI scores. *Brain stem* (vascular insult): essentially normal threshold sensi-

tivity; normal type Békésy audiogram with continuous and interrupted tones; speech discrimination poor on side contralateral to lesion; loudness function equivocal (in example shown); (SISI scores not discussed). *Auditory cortex* (left temporal epilepsy): normal threshold sensitivity; (Békésy audiogram not discussed); speech discrimination normal with undistorted speech, poorer than normal in contralateral ear for distorted speech; loudness function apparently abnormal in example shown; and low SISI scores. In general, sensitivity for pure tones 'is maximally affected by peripheral lesions and progressively less affected as the site of lesion moves centrally.' Discrimination for ordinary speech is affected most by the 'bottleneck region of the VIIIth nerve and brain stem, less affected by cochlear lesion, and not at all by either middle ear or cortical lesion.' At the cortical level 'only the ability to perform relatively subtle and difficult listening tasks is demonstrably affected.' (R.G.)

387. KANADANI, M., Studies on PGSR audiometry. II. Results of examinations in young children with severe hearing loss by PGSR audiometry, play audiometry and startle reflex test. (Japanese text.) *J. otorhino-laryngol. Soc. Jap.*, Tokyo, 62(9), 1959, 1951-1957.

PGSR audiometry has been proved to be a more satisfactory test for younger children than the play audiometry. Compared with play audiometry or startle reflex test, the results show that its reliability is considerably greater and that it is an excellent method for examination of the hearing acuity in younger children with severe hearing loss. (*Excerpta Medica*, XI)

388. KNIGHT, J. J., and COLES, R. R. A., Determination of the hearing thresholds of naval recruits in terms of British and American standards. *J. acoust. Soc. Amer.*, 32, 1960, 800-804.

A model 61 Amplivex audiometer with PDR-1 receivers was calibrated according to the American standard. An extra 20 db attenuator pad was added for finer threshold measurements on 111 Royal Navy recruits, threshold results on whom were compared with those of experienced, motivated subjects. Thresholds were determined pri-

marily by the descending technique. An attempt is made to compare the American and British standards on the basis of samples used, more stringent standards, etc. (*B.A.L.*)

389. KNOX, E. C., A method of obtaining pure-tone audiograms in young children. *J. Laryngol. Otol.*, 74, 1960, 475-479.

Two pieces of apparatus are described and recommended as motivating devices which facilitate auditory threshold measurement of young children. One of these, called the 'pop-up toy,' is used with a pure-tone audiometer and a control box. If the child presses a switch when a tone is being presented, a toy or other object of interest to a child pops up and a light turns on 'if it is being used.' The second device, called the 'adapted toy,' rewards the child by enabling him to open a door, behind which there is a doll's garment or other attractive object, when a tone is presented. (*C.L.*)

390. KODMAN, F., Jr., FEIN, A., and MIXSON, A., Psychogalvanic skin response audiometry with severe mentally retarded children. *Amer. J. ment. Def.*, 64, 1959, 131-136.

Response latency under two reinforcement schedules in a PGSR audiometric conditioning situation was determined for 31 institutionalized children with a mean age of 14 and mean IQ of 38. In addition, a subjective relative speech threshold was obtained by subjective speech audiometry. PGSR audiometry was effective in 28 of the cases, and a moderate positive correlation obtained between the GSR and speech thresholds. Response latency was on the order of one second. The two schedules of reinforcement produced no significant differences. (*Child Developmt. Abst. Bibl.*)

391. MEHMKE, S., Zur Theorie und Praxis des Gellé-testes. (Theory and practice of the Gellé-tests.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(9), 1960, 577-588.

The Gellé test has become the subject of increasing controversy. The modern form of the air-Gellé test constitutes an exact and reproducible method. The bone-Gellé, however, is still rather obscure. It was shown that an optimal bone-Gellé may only be obtained through a maximal 'physiological Weber' to increase the sec-

ondary air component of the sound. The bone-Gellé practically constitutes bone conduction with its air elements suppressed. A simple method of the bone-Gellé test is given, which is suitable for clinical use, and which at small expense gives equally good results as the air-Gellé test. The diagnostic significance of the Gellé test rests on its physical mechanism. The mechanism of the bone-Gellé is traced through the secondary air component of bone conduction (Carhart-notch + 'physiological Weber'). The pressure changes in the external auditory meatus result in increased impedance of the drum and a simultaneous decrease in the mobility of the drum and ossicles. The effect is markedly dependent on frequency. The Gellé effect is thus a criterion of the mobility of the ossicular chain, which is generally more limited in otosclerosis than in adhesive processes. The Gellé test may thus be a valuable method of distinguishing adhesive processes from otosclerosis. (*Author's summary*)

392. MITRONOWICZ - MODREJEW-SKA, A., Wpływ bodźców słuchowych na chronakcję narządu przedsionkowego. (Influence of acoustic stimuli on the chronaxy of the vestibular organ.) *Otolaryngol. Pol.*, Warsaw, 13(3-4), 1959, 643-647.

The hair cells of the organ of Corti are similar to those of the static organ. There is a significant interdependence of the pathological changes of both kinds of the sensorial cells. Both form a common 'system of hair cells of the inner ear.' The aim of this study was to answer the question whether the mechanical acoustic energy conducted by the perilymph to the organ of Corti is transmitted also to the static organ. The study showed that the acoustic stimulus (70-80 db) shortens the chronaxy of the vestibular organ. This reaction appears only when the hair cells of the inner ear are intact. When the conductive part of the ear is disturbed the influence of the acoustic stimulus on the vestibular organ is like that of a normal ear. The examination of the influence of acoustic stimulus on the vestibular organ is especially important in children's audiology. It is an objective method which permits differentiation of the lesions of the conductive and the perceptive apparatus of the ear. (*Excerpta Medica, XI*)

393. NORTON, M. C., and LUX, E., Double frequency auditory screening in public schools. *J. speech hearing Dis.*, 25, 1960, 293-298.

A study of double-frequency auditory screening was necessitated by a growing demand in public schools for rapid and reliable pass-fail type auditory screening methods where the use of sound treated areas or facilities are not available. The present study was undertaken to determine the practicability of using the double-frequency method for that purpose. A sampling of 1046 subjects was taken from four schools which represented a cross section of the socio-economic structure of the community. The selections were made on the basis of age, grade level, and school. The rapidity and reliability of the method were checked through a comparison with the standard five-frequency pure tone method now in use in many school districts. On the basis of the results of the study, several conclusions were suggested concerning the effectiveness of the double-frequency method: (1) The double-frequency method appeared to be less reliable than the five-frequency method. (2) It was simpler and considerably faster to administer, and was less fatiguing for the testor. (3) As it was administered in a familiar classroom environment, it was less distracting for young children. (4) Less advanced preparation was needed in the administration of the testing schedule; moreover it did not necessitate the disruption of class schedules. (5) The long range implications of using double-frequency audiometry cannot be ascertained from a study of this nature. Proper longitudinal studies must of necessity be undertaken for that purpose. (*Authors' summary*)

394. OYER, H. J., and DOWDNA, M., Word familiarity as a factor in testing discrimination of hard-of-hearing subjects. *Arch. Otolaryngol.*, 72, 1960, 351-355.

This study was undertaken in an attempt to determine the influence of familiarity on the responses made to C.I.D. Auditory Test W-22 by hearing handicapped individuals. Responses of 400 ears were used; 30% were conductive, 34% were perceptive, 21% were mixed, and 15% were functional. Familiarity rating of words was based on

the Thorndike-Lorge count. Words occurring 100 or more times per million words in general usage are classified as AA. Those occurring at least 50 times but less than 100 times per million words are classified as A. Words occurring at least once but less than 50 times per million are classified as less than A. The main generalizations were: (1) The major portion of the W-22 words are highly familiar. Only 17% occur less than 50 times in every one million words. (2) Substitution errors increase as word familiarity decreases. (3) Omission errors decrease with increase in number of less familiar words for discrimination. (4) Distribution of errors on the 200 words was not even. Fifty percent of the errors were made on 38 (19%) of the words. They were: west, gave, we, knee, yet, start, near, can, east, tie, camp, cars, send, ears, high, move, save, then, dust, nest, key, tea, owes, cap, dull, wool, smart, pew, stiff, ache, ace, dolls, knit, bathe, carve, deaf, chew, ham. (5) of the 38 words, 18 (47.3%) have AA values; 9 (23.6%) have A values; and 11 (29.1%) less than A values. The degree of familiarity of these words is somewhat proportionate to the degree of familiarity characteristic to the total number (200) of words. (*J./.*)

395. RUBIN, H., Auditory facilitation following stimulation at low intensities. *J. acoust. Soc. Amer.*, 32, 1960, 670-681.

Low-intensity stimulation by the test tone has the effect of improving threshold for that tone by as much as seven db. More intense stimulation either does not change the threshold or will raise it. Short duration, low-intensity stimulation with a noise band facilitates threshold for a tone near the middle of the noise band. The theoretical nature of this process is discussed. (*B.A.L.*)

396. SALONNA, F., Rilievi audiometrici tonali in traumatizzati cranici senza frattura della rocca. (The results of tone audiometry in patients with cranial trauma without fracture of the petrous bone.) *Riv. Audiol. prat.*, Milan, 9(4-5-6), 1959, 71-83.

An audiometric examination was carried out in 37 persons with cranial lesions without fracture of the petrous bone. The results are reported and discussed, and compared with the findings of previous investi-

gators in this field. Reference is made to the frequency of auditory deficiencies, its relationships with the site of the trauma, aspects of the audiometric curve and their relations with the site of the trauma and of the acoustic lesion, and the evolution of the deficiency. Some conclusions are formulated. (*Excerpta Medica, XI*)

397. SCHOENFELD, S., and GOLDSTEIN, R., Electrophysiologic responsiveness and alpha rhythm in children. *J. speech hearing Res.*, 3, 1960, 288-290.

A study was made of 24 normally hearing children to determine whether or not relations previously noted in adults among sex, EEG pattern, and electrodermal responsiveness to sound would be present. Auditory stimuli were 1000-cps tones presented monaurally at 40-db sensation level. The experimental session consisted of eight tones without reinforcement, five tones reinforced with annoying electric shocks, and eight tones without reinforcement. Analysis of variance failed to show any significant interactions among sex, EEG pattern, and electrodermal responses. (*Authors' summary*)

398. SCHULZ, E., Lichtreflexaudiometrie und Differential-diagnose zentraler Hörstörungen. (Light reflex audiometry and differential diagnosis of central hearing disorders.) *Z. Arztl. Fortbild.*, 53(21), 1959, 1323-1326.

Employing the well-known principle of PGSR, the author proposes a modified system of conditioned audiometry. A light stimulus (nitraphot lamp of 500 w.) is used for conditioning, and changes in skin resistance are recorded with an electrocardiograph. These modifications are believed to improve the technique of reflex audiometry. However, differential diagnosis is not promoted by such procedures. At present, Matzker's central speech audiometry offers the only objective approach to that problem. (*Excerpta Medica, XI*)

399. STENFER, G. R., Observaciones realizadas en exámenes audiométricos de enfermos tuberculosis internados en el Hospital Muñoz—Resumen. (Observations derived from the audiometric examination of tuberculosis patients interned in the Muñoz

Hospital—Resumé.) *Fono Audiologica*, 6, 1960, 114.

The author points out the necessity for the exercise of audiologic judgment in the decision to treat patients with acute infectious tuberculosis with streptomycin. He emphasizes the necessity of preserving hearing for the speech frequencies and advocates audiometry prior to and concurrent with treatment. (*M.S.W.*)

400. U. S. VETERANS ADMINISTRATION, Audiology; the determination of hearing loss. Washington, D. C. Govt. Print. Off., (Dept. of Med. and Surg. Information Bull., IB, 1960, 10-115)

In this bulletin published for staff members of the Veterans Administration, basic information essential to the understanding and utilization of audiometric tests for measuring hearing losses is given. Administration and interpretation of four tests used within the VA are described. Tests to isolate nonorganic auditory deficiencies are: galvanic skin resistance audiometry, the Doerfler-Stewart test, the delayed feedback technic, and the Stenger procedures. Illustrations of methods for recording numerically and graphically the pure tone thresholds and results of speech audiometry are included. This issue of the Information Bulletin is available from U. S. Superintendent of Documents, Government Printing Office, Washington 25, D.C., at 15 cents a copy. (*Rehab. Lit.*)

401. WILLIS, H. S. K., and HOFFMAN, I. L., Hearing loss from high intensity sound of jet engines. *Aerospace Med.*, 30(10), 1959, 764-772.

Analysis of the audiograms of 1,685 persons exposed to high intensity sound from jet engines incurred hearing loss of the perceptive type in varying degrees. In a control group of 362 subjects, 5.24% had perceptive hearing loss. Of these, 3.52% had had previous exposure to high intensity sound for at least two years. There is a significantly greater risk of incurring hearing loss in some persons. The susceptibility for hearing loss from noise trauma increases with age. The apparent synergism of age and exposure comes into effect at a much earlier age than presbycusis as seen among a population not routinely exposed to loud noise. (*Excerpta Medica, XI*)

402. ZAO LI, G., *La sordità professionale nei telefonisti.* (Occupational deafness in telephonists.) *Minerva Otorinolaryngol.*, Torino, 9(8), 1959, 268-283.

The results are presented of a series of clinical researches in 341 telephone workers. It was found that: (1) After the age of 40 yr. the percentage of traumatized individuals increases significantly; after the age of 50 yr. traumatic hypoacusia is associated with presbycusis. (2) The incidence and severity of occupational deafness increase proportionally with the duration of exposure to the stimulus. An initial dip at about 4,000 cps, characteristic of the first years of occupation, is followed by a progressive involvement of the higher frequencies and after 15 yr. of occupation all the frequencies above 1,000 cycles are involved. (3) The type of occupation influences the localization and severity of the trauma. Female telephonists show an initial dip at about 2,000 cps and less marked hypoacusia than male workers, who show an initial dip at about 4,000 cps. (4) Tubo-tympanitis does not seem to influence significantly the appearance of the trauma. A study of the recruitment by Fowler's method in individuals with monolateral acoustic trauma gave positive results. Lüscher's method, on the contrary, gave negative or doubtful results in patients with bilateral lesions. Tests of auditory fatigue gave the same results in normal and injured subjects. From the standpoint of prevention, the following measures are proposed: the resonance of receivers should be eliminated, the receiver should be used alternately on each ear at intervals of one week, acoustic signals should be substituted as far as possible by luminous signals. (*Excerpta Medica*, XI)

AUDITORY TRAINING

403. BEARD, C. A., *Rhythm for deaf children?* *Teach. Deaf*, 58, 1960, 253-256.

By developing a sense of rhythm and response to rhythm with movement the imagination of deaf children can be awakened and situations for spoken language increased. The question is asked, 'How can we use rhythm to help deaf children acquire and use spoken language?' Using the same procedure as with hearing children of imitating and learning various

rhythmic patterns, nursery rhymes with bodily movements, the deaf children 'take pleasure in using their voices and have the same kind of fun.' Regular rhythm training periods are described making use of induction loop from an amplifier, loudspeakers, piano, tape-recorder, and record player. Programs for the public such as a Nativity Play or School Pantomime are part of the year's program. Each child's progress in rhythm and speech is followed from year to year. (M.S.K.)

404. EWING, A. W. G., *Audiology in schools for the deaf.* *Teach. Deaf*, 58, 1960, 277-278.

The science of audiology is spreading to involve most deaf children to the extent that very few cannot be helped by hearing aids. Experimentation in England as well as evidence from Holland and America support this view. Studies of linguistics, electronics, and experimental phonetics contribute to an understanding of special problems of communication. Investigations in child health and laryngology dealing with causes of deafness, brain damage, and oral failure are pursued. Three main categories of deafness as classified by Dr. Clarence Hudgins are: (1) the hard of hearing with less than an average loss of 65 db amongst whom adequate attention to hearing would make normal language possible; (2) the partially deaf with hearing losses between 65 and 80 db, many of whom have some naturally acquired speech but who are dependent upon training for auditory discrimination; and (3) the profoundly deaf with hearing losses exceeding 80 db, who benefit most from development of hearing in combination with lipreading. The importance of making sound meaningful involving sensory experience associated with emotion and touch from early months of life is stressed. Speech motivation including hearing and lipreading of speech in real life situations, stressing sentences rather than single words is noted. In the Combined Speech Experiment conducted at Manchester University attention was given to the analysis of speech of deaf children. It was noted that speech based on children hearing their own voices was producing phrases, sentences, and continuous streams of sound. (M.S.K.)

405. RITTMANIC, P. A., Hearing rehabilitation for the institutionalized mentally retarded. *Amer. J. ment. Def.* 63, 1959, 778-783.

At the Dixon State School a hearing survey of 1,220 mentally retarded patients was conducted to locate those who had medically and/or socially significant hearing impairments so that a therapeutic program could be instituted. Only those patients were selected who could respond reliably to an individual pure-tone audiometric screening test. Those ruled out were the severely retarded, emotionally disturbed, uncooperative or unwilling and hospitalized patients. The age range was from 6 to 80 yr. and the IQs ranged from 30 to 129. There were 589 males and 631 females. The criteria used for defining a medically significant hearing loss was a loss in excess of 15 db for 2 or more frequencies in one or both ears. Hearing losses were discovered in 40.5% of the group but 80% of these cases required only conservative medical treatment. Hearing loss showed a steady increase with age—varying from 19.8% for the 10- to 19-year age group to 84.2% for those 60 yr. of age and over. It is significant that the school age group with its 19.8% with hearing loss is approximately 5 times as great as reported in the normal public school population. A hearing conservation program was begun involving: screening testing, individual threshold testing, otological referral, medical treatment and aural rehabilitation. A hearing aid was not considered unless the loss for speech in the better ear was at least 30 db, although other factors such as personality adjustment, intelligence level, and personal responsibility were also considered. During the 6-month period following the survey, 75 or 15% of the total hearing defective cases were given otological examinations. Hearing aids were recommended for 20 but only 15 were fitted with individual hearing aids and placed in the aural rehabilitation program. The processing of the remaining cases is continuing. It is evident that a small proportion of mentally retarded patients with auditory impairments can profit from a program of aural rehabilitation which includes the use of a hearing aid. It is also noted that impaired hearing can produce behavior which is

suggestive of mental deficiency and also contribute to educational retardation, especially in those cases where the loss has not been detected. This program has already resulted in a number of patients who have returned to community living with better personal adjustment and economic sufficiency. For others who will remain institutionalized, a fuller enjoyment of life has been the result. (*Excerpta Medica*, XIX)

DIAGNOSIS AND APPRAISAL

406. BARELADZE, P. L., The functional role of the fenestra rotunda in the prognosis of fenestration in otosclerosis. (Russian text) *Vest. Otol-Rino-Laringol.*, Moscow, 21(1), 1959, 66-70.

A study was made on 19 bodies of changes in the intralabyrinthine pressure transmitted to the labyrinth through the oval and round fenestrae 10-16 hr. after death. The vertical osseous semicircular canal was opened in the region of eminentia arcuata and the pressure transmitted to the labyrinth through both windows, round and oval, was measured. For the purpose of examining the pressure transmitted to the labyrinth through oval window only, the tympanic cavity was opened in the region of the tegmen tympani; thus, free communication between tympanic cavity and the outer atmosphere excluded transmission of pressure through the membrane of the round window to the labyrinth. Results of the investigation testify that mobility of the membrane of the round window in the human body, in the majority of cases, somewhat exceeds or is equal to the mobility of membrane of the oval window. The degree of resistance of the secondary tympanic membrane was examined in patients with otosclerosis, prior to operation, with the aid of an oto-audiometer and a device attached to it for increasing the pressure in the external auditory meatus. The pressure sensitivity of the labyrinth was determined with the use of various pitched sounds. Hearing improvement following fenestration of the labyrinth was in direct dependence upon the resistance of the membrane of the round window: the greater its mobility, the more favorable is the prognosis with regard to increase in hearing in the post-

operative period; in cases with increased resistance in the secondary tympanic membrane, fenestration of the labyrinth showed insignificant hearing increase. It is concluded that it is desirable to investigate the functional capacity of the membrane of the round window (degree of resistance) prior to operation, in order to form in patients with otosclerosis a correct prognosis with regard to hearing increase after operation. (*Excerpta Medica*, XI)

407. **HORMIA, A.**, Hypacusis i samband med kraniocerebral skada. (Hypacusis in connection with craniocerebral injury.) *Finska Läk.-Sällsk. Handl.*, 102(1), 1959, 163-172.

In the light of a material of 135 war veterans the general characteristics of the deafness connection with craniocerebral injury are briefly presented. The results are in accordance with the view that the hearing impairment is due to a concussion of the labyrinth. After this, the difference limen of intensity was studied in 43 cases. It could be concluded that a reduced difference limen is not characteristic for the hearing impairment in connection with craniocerebral injury. This result is not in accordance with the prevailing opinion that a reduced difference limen is typical for end-organ deafness. The presumption is that the absence of a reduced difference limen is due to a more uniform damage of the organ of Corti with its nerve supply than in other forms of end-organ deafness. A high difference limen was seen in one-half of the cases. Especially cases with deteriorated (auditive) perception and attention capacity were prone to a high difference limen. A sense-physiological interpretation of the difference limen phenomenon is given. The value of the investigation of difference limen as a test method for studying the organic psychosyndrome characteristic of cerebral injury is discussed. (*Excerpta Medica*, XI)

408. **HOUSE, W. F., and GLORIG, A.**, Criteria for otosclerosis surgery and further experiences with round window surgery. *Laryngoscope*, 70, 1960, 616-630.

(1) At present there seems to be no maximum bone conduction thresholds to contraindicate oval window surgery in otosclerosis. (2) The minimum air-bone gap

that is practical to attempt to improve by oval window surgery has not yet been established. This seems to be the principal limitation on the indications for oval window surgery. (3) Otosclerotic patients with stapes fixation and hearing loss beyond the limits of present audiometric measurements can be improved by oval window surgery, providing an unmeasurable air-bone gap is present. Diagnostic procedures for these patients should be improved. (4) Patients with extensive otosclerosis often have closure of the round window. Opening this window with a drill through a transcanal approach has not proved beneficial, and in three cases it has been detrimental. We are, therefore, abandoning round window surgery until more precise controlled methods can be developed. (*Authors' Conclusions*)

409. **JERGER, J. F., and BUCY, P. C.**, Audiological findings in an unusual case of VIIIth nerve lesion. *J. aud. Res.*, 1, 1960, 25-34.

Remarkable recovery of pure-tone acuity following surgical removal of a meningioma in the right cerebellopontine angle provided a unique opportunity to study several facets of auditory behavior in a single patient. Loudness recruitment was absent, speech discrimination was extraordinarily affected; and severe threshold adaptation under continuous stimulation was apparent. No abnormality in the masking of pure tones by either broad or narrow band noise could be demonstrated. (*Authors' summary*)

410. **REINECKEN, R.**, Vestibularisuntersuchungen nach Operationen am ovalen Fenster. (Vestibular examinations after fenestration operations.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(7), 1960, 432-438.

The literature concerning vestibular disturbances after fenestration operations is discussed and the author's own experience of such disturbances after operations on the oval window is presented. Thirty patients were examined by nystagmography before and five to seven days after surgery on the oval window. A quarter of the patients complained of vertigo before operation and exhibited spontaneous nystagmus. About half showed inequalities in the caloric and

rotatory tests preoperatively. Walking blindfolded, Romberg's and Bárány's pointing tests were all normal. Positional nystagmus was seen in only one case before operation. Postoperatively two-thirds of the cases showed spontaneous nystagmus, rather more had shaking nystagmus and 10% had positional nystagmus. Differences in rotatory and caloric tests were even commoner than the spontaneous vestibular signs, but the number of patients actually complaining of vertigo was no greater after from the fifth to the seventh day than before the operation. No relationship could be found between the operative technique used and the incidence of vestibular disturbance. It was observed, however, that whenever there was a perilymph leakage at operation, the ensuing vestibular disturbances tended to be more marked. The increased incidence of postoperative positional nystagmus is probably due to the proximity of the utricle and saccule to the operative field in the oval window niche. The rarity of late vestibular disturbance after stapes mobilization was commented on. (*Author's summary*)

411. WILMOT, T. J., SEYMOUR, C. J., Diagnosis and treatment of vascular insufficiency causing perceptive deafness. *Lancet*, 1, (7134), 1960, 1098-1102.

Of 981 cases of perceptive deafness, 317 were selected as having adequate investigative work-up with no known cause of hearing loss. Patients were quite apt to: (1) be over 40 years old, (2) have a gradual onset of hearing loss. Vertigo and fluctuation of acuity level appeared in less than half the subjects. One of four subjects experienced improved hearing after injection blockage of the sympathetic ganglion, at or above the stellate ganglion. Symptom interrelations were found in that, for example, the briefer the history of hearing loss, the greater is the likelihood of acuity fluctuation and improvement in hearing from sympathetic block. Prognosis from increased labyrinthine circulation is best for early cases with fluctuating deafness with vertigo. (*J.C.S.*)

EDUCATION

412. ALLEN, P., Physical education in the junior school. *Teach. Deaf*, Birmingham, 58, 1960, 293-294.

Two main principles for physical education for junior children, ages 8-12, include: (1) a short period of free activity using free choice of small apparatus such as tennis balls, bean bags, sticks, mats, ropes and followed by (2) a general directed activity period for individual, partner, and group apparatus work using balance benches, ropes, climbing frames, vaulting boxes, and agility mats. Skills are discovered and developed at the rate of each individual. An important aspect of group activity is using gross motor movements as a basis for the development of skills for games. Dramatic movement is emphasized with younger children to stimulate imagination and provide for emotional release. (*M.S.K.*)

413. COLE, R., Television for deaf children. *Volta Rev.*, 62, 1960, 256-259, 281.

This article reviews the television programs that were started seven years ago as an experiment by the B.B.C. Today the programs are still in progress and have progressed from six minutes to approximately 30 minutes once a month. The B.B.C. insists that the programs be entertainment not instruction. The basic technique is to keep the pictures simple, entirely visible, with a minimum of captions and announcements, clear speaking in large close-ups, and exact repetition of spoken words in written form. The spoken word is always first followed by the caption. The film is stopped for this to be carried out. The B.B.C. makes their own programs. These have involved trips to museums, cooking programs, civil engineers working, trips through potteries, how the members of the city and the national government carry out their duties. The author feels that these programs have been a wonderful help to the National Institute for the Deaf in keeping before the public the problems of the million and a half deaf persons, their handicaps and their problems. He feels that even those who do not watch the programs realize that there are deaf people because they are announced in the programs of radio and television. Because the B.B.C. is not a profit-making institution they can carry on such a program and he feels that it is of great advantage to the deaf as entertainment and public information regarding their problem. (*J.M.*)

414. CURRY, A., *Visual aids. Teach. Deaf*, Birmingham, 58, 1960, 282-284.

The National Committee for Visual Aids in Education is producing film material suitable for the needs of various groups in education including the needs of deaf children. Although the ultimate educational aim is the understanding of words, visual aids lend reality to language as it is taught deaf children. 'Films and filmstrips in which children play a part in the action, help those watching to identify themselves with the experience or material portrayed.' (M.S.K.)

415. DYACHKOV, A., *The soviet system of educating deaf children. SCR Sov. Ed. Bull.*, 7, 1960, 1-8.

Developments since 1917 are discussed, with details of the more important conferences and legislation related to educating deaf children. Contrasts are made between the present system and that existing before 1917, when only 3,000 out of 45,000 deaf children (6.5%) were being taught. Legislation includes the decree of July 5, 1918, nationalizing all educational premises and entrusting welfare of the deaf to three Commissariats of Education, Health, and Social Security. Details are given of All Russian Conference to Combat Physical Handicaps among Children (1920) with contributions from I. A. Vasiliev and N. M. Lagovsky. The role of preschooling for the deaf is outlined and promotion of oral speech emphasized; main types of special schooling for deaf children are given theoretical consideration. This work was continued by conferences in 1921, 1922, 1923. Central legislation confirmed these decisions into practice after 1926. Universal Primary Education for handicapped children was introduced in 1931 and statistics show progress since that date to 1941, e.g., 1932, 79 schools with 7,053 pupils, 1941, 271 schools and 31,426 pupils; many different types of schools were established for various categories of deaf and deafened children. Emphasis is placed upon the importance of a differentiated approach to the teaching of the deaf; value of universal compulsory primary education; total development of children and compensatory potentialities; and value of vocational training: all within framework of principles of Communist education. Changes are implicit

in the new educational policy put forward at the 20th Congress of CPSU (universal ten-year school and polytechnic training) and are expected to present problems in education of the deaf. Preschooling, speech teaching, and teacher training in general are also being revised. Social causes of deafness are said to have been eliminated from Soviet life and the number of deaf children to be decreasing each year. (H.G.W.)

416. EWING, A. W. G., *The modern educational treatment of deafness. Teach. Deaf*, Birmingham, 58, 1960, 156-159.

Papers presented at the International Congress held in the Department of Education of the Deaf, Manchester University, June 1958, are available in book form. Sections include—recent developments in knowledge about hearing; aetiology, pathology, and management of deafness in childhood; integration of deaf children into hearing society; clinics for deaf children; demonstrations by pupils from the Institute for the Deaf, Sint Michielsgestel, Holland; ascertainment of deafness in infancy, diagnostic tests of hearing and parent guidance; demonstrations of classes of deaf children using hearing aids and inductance loops; fundamental linguistic development; educational treatment of deafness in different cultural background; capacity of deaf children to benefit from hearing aids; teaching of speech and language; assessment of residual hearing, guidance and placement in school; mental growth and mental health; acoustics and use of hearing aids; fundamental problems in the design and fitting of hearing aids; differential diagnosis of hearing disorders; deaf children with additional handicaps. (M.S.K.)

417. EWING, A. W. G., and VAN UDEN, A., *Education of the deaf in the U.S.A. and 'the combined method.'* *Teach. Deaf*, Birmingham, 58, 1960, 103-111, 178-180.

Two professional visitors from Europe interested in education of the deaf report their observations on four visits to the United States extending from 1946 to 1958. Diversity of organization and method, provision of teaching and training for deaf youths and girls over sixteen and over twenty years of age, and developments during the post-war years are discussed. The

most pronounced differences in organization and method are noted between state residential schools and Gallaudet College where combined and simultaneous methods are used and private residential and day schools and classes employing the oral method throughout the school. Recognition is given to developmental language as described by Dr. Mildred Groht in *Natural Language for Deaf Children* and observed in the Lexington School, New York City. Communication by manual language, speech, and written language by Dr. Irving V. Fusfeld are assessed. Significant policies in training for deaf students over sixteen are those observed at Clarke School, Mass., and St. Joseph, St. Louis, Mo., which aim to integrate deaf students in high school and institutions of higher education with hearing students, and the policy of Junior High School #47, New York City, which integrates selected deaf children with hearing children in elementary grades. A second policy is extending vocational training in state residential schools beyond the age of 20. The establishment of audiology clinics or speech and hearing centers in American universities, hospitals, and schools for the deaf, and the application of techniques in speech audiometry are noticeable developments during post-war years. Medical-psychological-educational collaboration as exemplified by differential diagnosis and pre-school and home-training are noted in several medical and educational centers in the United States. (M.S.K.)

418. GREEN, P. B., Physical education. *Teach. Deaf*, Birmingham, 58, 1960, 285-289.

General aims of physical education are discussed. The development of moral qualities of resolution, initiative, and self-reliance together with social attitudes of good sportsmanship, fair play, and self-discipline are fostered. Accident prevention in physical activities is stressed. Athletic activities as cross-country running, camping, canoeing, sailing, golf, hill-walking, rock-climbing, badminton, and fencing are all part of a physical education program. (M.S.K.)

419. HUTTON, C., A diagnostic approach to combined techniques in aural rehabilitation. *J. speech hear. Dis.*, 25, 1960, 267-272.

The author presents a rationale for combining auditory and visual stimuli in aural rehabilitation. There are about twelve groups of phonemes, the members of which are likely to be confused with each other when presented auditorily, e.g. (t) and (k). There is, however, relatively little confusion between these groups. Similarly, there are visual confusions occurring within, but not between, approximately eight groups. Since in certain instances there is little similarity between auditory and visual confusions, the author suggests that by combining the two sensory discrimination channels in aural rehabilitation, phoneme intelligibility is high enough for effective communications. Prior to initiating training, the client is exposed to a diagnostic program designed to reveal specific phoneme errors made by auditory, visual and combined stimuli. The training program itself consists of nine steps, discussed briefly in the article, beginning with the explanation of the concept of speech sounds (phonemes), and ending with modification of the client's listening condition, e.g., his learning to pick out the most advantageous listening positions in large rooms. The effects of the diagnostic approach to combined training are illustrated in a table summarizing the intelligibility gains occurring in eighteen clients having an average loss of 47.1 db in the 500-2000 cps region, and an average age of 45.5 years. The gain in combined intelligibility for this group was 8.3 per cent. Those who showed the most gain for combined stimuli also showed substantial gain in both auditory and visual discrimination. Those making the largest gain in auditory scores tended to make little gain in visual discrimination and only moderate gain in combined discrimination. Those with the largest visual discrimination gain exhibited even less combined gain. Clients under age 50 seem more likely to benefit from combined training than those over 50. (S.I.G.)

420. JOLLY, F., Educating the deaf and hard of hearing in our 50th state. *Volta Rev.*, 62, 1960, 158-160.

In Hawaii the educational program for children with hearing handicaps is under the direction of the Department of Education, but other agencies also cooperate and provide consultant and treatment services.

The article describes the Diamond Head School, the University Hearing and Speech Clinic, and the cooperation between these and the Department of Health and the Royal Elementary School. Children are seen for diagnostic services at the University Hearing and Speech Center or at clinics held in cooperation with the Department of Health. Three types of programs are carried on: (1) full time enrollment in a regular class with supplementary speech, speech reading, and hearing aid instruction provided by a speech therapist; (2) part time enrollment in a regular class supplemented by part time enrollment in a special class wherein a trained teacher of the deaf develops speech, speech reading, and auditory training; (3) full time enrollment in the Diamond Head School where those children who need it will get oral instruction through specialized techniques used for teaching the deaf. Children entering school for the first time are placed in a diagnostic observation center located at the Royal Elementary School. The children are seen by a psychologist, a hearing and speech therapist, and by a physician. The children are then staffed and recommendations are made as to the proper placement. Approximately 50% of the children referred to Diamond Head School have received diagnostic and medical services from the Department of Health prior to their entrance into the school. The Health Department tests approximately 1,200 preschool children each year as well as selected kindergarten children. In 1959 over 2,000 kindergarten children were tested. (J.M.)

421. JONES, J. P., Physical education for the deaf. *Teach. Deaf*, Birmingham, 58, 1960, 325-326.

Physical education contributes to the general education of deaf children in three ways: (1) exercises and movement requiring footwork—the basis of support; (2) the rhythm of movement which will eventually help in the child's speech; and (3) hard physical effort forcing the child to breathe deeply and thus develop his lungs and breath-control. Participation in games as a member of a team helps to develop self-confidence. Interest in activities such as fencing, cycling, golf, tennis, and rowing lead to valuable social contacts. (M.S.K.)

422. KLOTZ, P.-L., Les difficultés dans la réadaptation et le réclassement des sourds. (Difficulties in readaptation and rehabilitation of the deaf.) *Readaptation*, 59, 1959, 15-18.

The rehabilitation of the deaf raises many difficulties, viz.: those of medical nature (rapidly developing lesions of the ear, bad working conditions such as humidity, dust and noise and the presence of a second infirmity); those connected with the hearing aids (noisy work, affections of the inner ear or of the auditory nerve leaving only rudimentary auditory structures, high costs of the apparatus); those of economical or social nature (difficulty for the young deaf person to find jobs since many branches are closed to him, difficulty of the deaf person to readapt after the age of 40, the period when deafness occurs most frequently); and finally those of psychological nature (mental deterioration, opposition to surgical treatment, to prostheses or to re-education, as observed frequently in persons who have been deaf for a long time). (*Excerpta Medica*, XIX)

423. LUMSDEN, J., Some thoughts on the teaching in American deaf schools. *Teach. Deaf*, Birmingham, 58, 1960, 160-168.

Sixteen residential and day schools in the United States with student populations of from 150 to 500 were visited. It is noted that signs and finger-spelling are a normal part of instruction of older pupils in most residential schools and the oral method is employed in day schools and in a few independent boarding schools. The oral method for young primary children was observed in all schools visited. Despite great distances, absence of national controls, and highly individualistic direction, the type of work seen is remarkably similar from school to school and the differences noted have little or nothing to do with methods employed. The use of standard readers and textbooks for hearing children rather than books written especially for the deaf was observed. The significant difference between the schools visited and schools for the deaf in England is the emphasis on teaching reading before the use of the written form in American schools. Reading for meaning is taught as a separate skill rather than associating it with oral expression (speech),

enjoyment of a story (literature), analysis of meaning (language), or writing an account of what has been read (composition). A distinction is made between reading as impression or taking in meaning and language expression. Despite high standards of reading, wide vocabulary, and great familiarity with language forms, comparatively little spontaneous or creative writing was observed. It is concluded that the advantages of emphasizing reading are; '(1) it opens up for the deaf children a world of information from books and papers, (2) if you can read, you can seek help from the printed word, (3) the wide—if not profound—knowledge of current American life obtained by reading stimulates an outgoingness among the deaf.' (M.S.K.)

424. MARTIN, R. R., *The public school program for acoustically handicapped children. Central States speech J.*, 9, 1960, 99-109.

Factors involved in public school educational programs for acoustically handicapped children are discussed. Research studies are reviewed with relationship to hearing testing, teacher referrals, medical referrals, intelligence testing, amplification, auditory training, speech reading, and placement. Suggestions in terms of placement and programs are presented for school administrators. An extensive bibliography is included. (J.B.R.)

425. MILLS, J., *Physical education with deaf children. Teach. Deaf*, Birmingham, 58, 1960, 289-292.

A discussion of a physical education program based on the principle of 'Basic Movement' using gymnasium apparatus is presented. The oral method with demonstration is used in giving instructions. After the children show what they can do with gym apparatus formal lessons are pursued. Lessons are in three parts; (1) 'warming up,' (2) applying movements practiced on the floor to small apparatus, and (3) practice on large apparatus. The children work in teams. 'Basic Movement' with adaptations has proven to be suitable to schools for the deaf and tends to develop all-round confidence, improvement in team games, and normal social behavior. (M.S.K.)

426. MOROZOVA, N., and KORSUNSKAYA, B., *Teaching children of pre-*

school age. SCR Sov. Ed. Bull., 7, 1960, 8-12.

Accomplishments of preschool training are shown where child's general development is not separated from the formation of speech habits. Early instruction in speech training is emphasized as well as social training gained within group milieu. Soviet preschooling for deaf children stems from work of N. A. and F. A. Rau, Moscow, 1900. The most important part of preschooling is speech teaching and practice; other school work is similar to that of normal children. Fingerspelling is used as an auxiliary aid to verbal speech, also with flash cards and instruction in oral speech. Social and moral training of young deaf children is also carried out during preschool stage. The value of fingerspelling is further discussed: pronunciation is corrected by meticulous work with definite planned material. Authors conclude with emphasis upon the value of preschooling and its contribution to primary school work and academic standards in general. (H.G.W.)

427. NAUDIN, M.-J., *Réflexions après un congrès: Manchester: La rééducation des enfants sourds. (Reflections after a congress: Manchester: Re-education of deaf children.) Réadaptation*, 59, 1959, 37-39.

The medical, affective and educational problems raised by deaf children are dealt with. Social integration of these children should be attempted. They should benefit from the modern educational methods and in this connection reference is made to the International Congress held in Manchester in July 1958. The knowledge recently acquired in the fields of audiology, audiosurgery and acoustic prostheses call for a modern outlook of society on the problem of the deaf-mute. Collaboration of otorhinolaryngologists, consulting physicians, pediatricians, health officials and teachers is necessary to instruct the deaf and their parents. Specialization of all this personnel is necessary. The first problem is the early detection, in early childhood, of deafness and hypacusia, and improvement of the possibilities of medical and surgical treatment of the chronically deaf. Personal prostheses, which should be distributed in large numbers, and collective devices should complete this program. The special psychology of the deaf calls for a family en-

vironment for the education because the use of the language by the contact with adults is better in these environments. For this it is necessary that the parents or those who take their place receive a special education. The prevention of deafness by the control of infections of the disease plus the advances made in obstetrics and pediatrics, together with an audiological department in a medical center will provide the best conditions for this prophylaxis. In addition, hearing tests in infants and very young children, measurement of the auditory residual, education of the children at preschool age and also of the parents will improve the results, putting an end to the dumbness of these deaf subjects. An ideal setting is education at home, and in Holland adoptive families are sought when the child's parents live too far from the educational centers. Each family adopts only one deaf child and this family lives near the re-education center for the deaf-mute. In other countries, the children are fetched by autobuses, which take them to the specialized centers. Finally, the number of pupils in each class is limited to six or eight. (*Excerpta Medica*, XIX)

428. OWENS, P. E., Some educational problems of today and their challenge. *Teach. Deaf*, Birmingham, 58, 1960, 223-226.

Two sociological changes in educational planning in recent years are discussed. One is the shift from the village elementary school which helped to solidify class distinctions and provide a limited but flexible and intimate program to the present day schools where ability grouping and more varied facilities are made available. To maintain the intimacy provided by the headmaster of the village schools, 'house tutors' in large schools are needed. The second sociological change is the educational opportunities available to intelligent members of the working classes. The emphasis has shifted from distinguished name schools to personal ability and integrity. (M.S.K.)

429. PURSGLOVE, T., The education of the profoundly deaf child. *Teach. Deaf*, Birmingham, 58, 1960, 245-252.

Educational methods and goals for the profoundly deaf child in contrast to those for partially deaf children are discussed.

Relying too completely on amplification and speech training instruments for the teaching of speech to the profoundly deaf child may be detrimental to his progress. It is asserted, 'However intelligible a deaf child's speech may be, it is useless without a comprehensive knowledge of language.' Vocabulary in language development and application of language teaching to everyday situations are emphasized. It is recommended that more than one means of communication be used with profoundly deaf senior students—speech, lipreading, writing, and 'grammatical finger-spelling.' Signs should be discouraged in the classroom but accepted as a child's only means of self-expression. (M.S.K.)

430. SABO, J., On accepting pupils in Norwegian schools for the deaf. *Teach. Deaf*, Birmingham, 58, 1960, 323-325.

Schools for the deaf in Norway are operated by the state and are supervised by the Director of Special Schools who represents higher pedagogical authority and is a specialist teacher. Norway has four schools for the deaf, one for partially deaf children, and special classes attached to ordinary schools in Bergen and Oslo. There are separate units for educationally subnormal and psychotic deaf children and a special school for brain-injured children. A one-year continuation school for advanced instruction in theoretical subjects and a professional school with a two-year course for deaf boys and girls are available. There is also a commercial school with a one-year course for hard of hearing pupils. The Director of Special Schools is responsible for school placement after a week's observation of beginners and a study of reports from specialists in psychological and medical fields. (M.S.K.)

431. SCHWEHN, D. B., What about high school? *Volta Rev.*, 62, 1960, 227, 238.

Portland, Oregon, Public School District has provided educational opportunities for hearing handicapped children for a number of years. Hard of hearing students who are able to compete in the regular classrooms are given assistance by Speech clinicians. Deaf students who need special help in all curricular areas receive training at the Hosford Day School for the Deaf until they are able to participate in the regular class-

room in the high school. Deaf children who have completed the elementary curriculum are then enrolled in Washington High School. Deaf students are scheduled one 58-minute period each day with a certified teacher of the deaf for speech, lip reading, auditory training, and language development. If there seems to be a particular need, a study period is allowed with these teachers and assistance can then be given in subject areas. There are also a number of hearing handicapped children who attend other high schools in the Portland area. These students are those whose ability to use language exceptionally well made it possible for them to be integrated in the regular elementary schools and then transfer into high school. The remainder of the article discusses the integration of these students in athletics, social activities, and study groups within the high school. (J.M.)

432. SMITH, B. G., Education of the deaf in Athens. *Volta Rev.*, 62, 1960, 167-168.

The author briefly describes the National School for the Deaf in Athens under the directorship of Miss Anyssia Tsantilis. Pupils range in age from seven to seventeen and there are 120 students in the school. The oral method is used throughout the school, and this school is also a training center for teachers. Arts and crafts are included in the program as well as rhythmic and dancing. There is no vocational training, but the graduates go to a regular training school for job instruction. There are both residential and day pupils. At the present time young children seem to be getting adequate care but the older children have failed to obtain training possibly because of lack of specific information about educational possibilities. Another one of the difficulties in this school is that approximately five percent of the school's population suffers from dual handicaps of mental retardation and deafness. There are no psychological services available and only a small amount of medical consultation. (J.M.)

433. SOCIETY OF TEACHERS OF THE DEAF, On units for deaf and partially deaf children. *Teach. Deaf*, Birmingham, 58, 1960, 195-202.

Memorandum of facts, opinions, and recommendations for establishing special classes for deaf and partially deaf children in schools for hearing children are outlined in detail. Topics include: definition of units and their function; aims of unit provision; factors affecting choice of schools; administration; treatment of classroom and equipment required; appointment of unit teachers and scope of their work; selection of unit children; size of unit classes; summary. This information is made available to local education authorities who are considering the establishment of special classes for hearing handicapped children. (M.S.K.)

434. WALLACE, H., Urban school services for children with hearing loss. *J. speech hear. Dis.*, 25, 1960, 281-289.

This article reports and discusses the results of a questionnaire study regarding school services currently being provided for children with hearing losses in the 106 cities of the United States having 1950 census populations of 100,000 or more. The questionnaire, which contained items regarding all types of handicapped children, was sent to the health officers and superintendents of schools of each of the cities. The results are based on the data gathered from 98 responding cities, having a combined total population of 41,686,921 and a combined school enrollment, ages five through 17, of 6,840,105; 93 of which had some school services for hard of hearing children and 73 of which had some services for deaf children. Five areas regarding the education of the acoustically handicapped child were explored: (1) the age of admission to school, (2) the types of educational placement provided (day class alone, day school alone, residential school, etc.), (3) the method of educational placement (the number and types of people reviewing the application and the provision for periodic review of children), (4) the financial aspects of educating the handicapped child (sources of funds and methods of allotment), and (5) transportation of children with hearing loss to and from school. The author concludes that there is considerable variation in the range of services provided. She makes suggestions for further strengthening of these services. (S.I.G.)

435. WALTER, SISTER MARY, Individual instructional seatwork. *Volta Rev.*, 62, 1960, 162-165.

The author suggests in her article that one of the most important aims in education is teaching the child to work independently. She states that we need to arouse in the child a certain eagerness to learn, to help him master the basic skills before introducing new skills, and to help the child use what he has already learned. In order to carry out the above ideas she has developed individual seatwork to be used after the introduction of the new material. She gives many suggestions for sentence construction, drill on verbs, drill on various question forms, and for carry over into spontaneous conversation. She describes how each child may have different seatwork to do and how this may be changed from child to child during the day. This is a quick method of checking to see whether the children have understood what they are doing. It also helps them grow in independence. She suggests that all the types of individual instruction described in her article are designed to give meaningful drill in an interesting manner and that they are to be supplemented by board work, duplicated seatwork, and oral practice. (J.M.)

436. WILKINSON, W., On secondary education. *Teach. Deaf*, Birmingham, 58, 1960, 114-122.

Results of a questionnaire submitted by the National College of Teachers of the Deaf to teachers of English and a survey of the development and organization of the education of deaf children above primary level are discussed. Among the needs are—more specialists trained in subjects taught the deaf other than speech and language; an extension of school leaving age for the deaf from the statutory 15 years to 18; additional secondary school opportunities for deaf girls; reappraisal of advantages of large schools for older deaf children over small schools within daily travel distance from home; and a County College for the deaf. (M.S.K.)

437. WILLIAMS, H. G., Other voices, other rooms. *Teach. Deaf*, Birmingham, 58, 1960, 235-236.

A notice is made of publication of 31 abstracts of 'Scientific Session on Questions

on Defectology' in Moscow, U.S.S.R. Topics include, *The Foundation of the Soviet System of Training and Educating Exceptional Children, Some Linguistic Problems Linked with Study of Aphasia, Principles in Setting Up Typology of Anomalous Children, The Role of Residual Hearing in the Work of Pronunciation for Deaf Children, Finger-Spelling's Contribution to Lessons in Speech Technique in Deaf Schools, Methods in Judging the Quality of Deaf Speech, The Application of Cinefilms in the School Training of the Pronunciation of Deaf Children.* (M.S.K.)

438. WILLIAMS, H. G., The pre-school education of deaf children in Russia: a general survey 1900-1960. *Teach. Deaf*, Birmingham, 58, 1960, 330-344.

Pre-school education for the deaf in Russia was started in Moscow in 1900 by Natalia Alexandrovna and Fyodor Andreevich Rau. During World War I the educational facilities were taken over by the government for blinded soldiers. In 1918 the Soviet Government nationalized all schools providing free education for deaf children beginning at the age of two years. Pure oralism was emphasized until the 1930's when the combined method was introduced. World War II temporarily interrupted the education of the deaf but schools were re-established. Present day pre-school education of deaf children emphasizes communication through oral speech. The method employed is termed 'neo-oralism' in which finger-spelling is used as an auxiliary aid to verbal speech together with written flash cards. Verbal material grows out of the child's needs and experiences rather than what he is able to articulate. Group hearing aids are used with children who have less severe losses and individual aids are uncommon in the Soviet Union. (M.S.K.)

439. WILLIAMS, H. G., Meticulous work with definite planned material. *Teach. Deaf*, Birmingham, 58, 1960, 344-347.

The 1959 edition of a Russian book, *Methods of Educating the Deaf and Dumb* by F. A. Rau, N. M. Lagovsky, and A. G. Basova is reviewed. It was originally published in 1934. The book comprises three sections—speech teaching, straight language work, and special pedagogical considera-

tions. The major portion deals with the establishment and correction of oral speech by F. A. Rau. (M.S.K.)

440. WOOD, W. E., Technical education. *Teach. Deaf*, Birmingham, 58, 1960, 284.

A discussion of problems relating to technical education as carried on in the school for the deaf at Burwood Park are presented. The difficulties of mathematics and scientific knowledge as well as speech and written and spoken language for the deaf student are noted. A technical college for the deaf is considered impractical but county colleges as suggested in 1944, but not yet in existence, offer hope in solving this problem for the deaf. (M.S.K.)

441. WOODFORD, D., The 'C' stream deaf child. *Teach. Deaf*, Birmingham, 58, 1960, 256-266.

The 'C' stream deaf child is defined as the one who achieves below the satisfactory standard of attainment. Children in this category include those with I.Q. below 85, physical handicap, temperamental instability and brain damage, late start, poor home background, prolonged hospitalization, non-English speaking parents, too long in a hearing school, and emotional insecurity. Expectations for this type child should be adjusted to meet his capabilities—as cited, 'It is clear that a handicapped child needs a higher than average I.Q. to achieve an average performance.' A comparison of achievement of backward deaf may be made with that of backward hearing children of the same age. Aims of social acceptance and social competence are important for these children. Individual progress and formulation of individual aims are helpful. The 'C' stream deaf child is not necessarily an oral failure but 'his greatest need is a two-way form of communication and where speech and lipreading are not progressing satisfactorily, something else must be substituted. His substitute must be signing and this as soon as possible must be extended to word recognition from the printed form.' The teacher has the responsibility to plan work to meet the needs of each individual rather than forcing everyone to work at a single group level. With the 'C' stream child nothing can be left to chance—'every-

thing has to be taught and taught carefully and thoroughly.' (M.S.K.)

ETIOLOGY AND PATHOLOGY

442. ALPERS, B. J., Vertiginous epilepsy. *Laryngoscope*, 70, 1960, 631-637.

The essential points for the diagnosis of vertiginous epilepsy are: (1) vertigo; (2) impairment or loss of consciousness, or amnesia for the attack; (3) no hearing loss, although there may be tinnitus, and (4) abnormal EEG. (R.G.)

443. ARVIERI, W., Neurite dissociata dell'VIII e blocco cocleare: contributo allo studio della sordità improvvisa. (Neuritis dissociata of the VIII nerve and cochlear blockage: contribution to the study of sudden deafness.) *Riv. audiol. Prat.*, Milan, 9(4-5-6), 1959, 91-103.

Sudden deafness may be caused by a number of pathogenetic factors. The author describes a monolateral case, where—on the strength of audiometric and vestibular findings—a diagnosis was advanced of isolated neuritic lesion of the cochlear nerve. It is believed that this form has arisen by the same process which causes the so-called 'e frigore' palsy of the facial nerve. These aspects of isolated neuritis of the cochlear nerve might be considered as due to 'cochlear blockage' if they were not accurately examined from the otoneurological point of view. In order to illustrate the most important aspects of both types of deafness, a typical case of cochlear blockage is described. (*Excerpta Medica*, XI)

444. BACH, E., Erfahrungsbericht über 5 Jahre Fensterungsoperation. (Experiences during five years of fenestration.) *Mscr. Ohrenheilk.*, 93(4), 1959, 204-212.

The prognostically very favorable cases A in group I (clinical otosclerosis) yielded 80% good results; cases B which were only barely indicated, yielded 60% of satisfactory results and cases C classified as unfavorable gave a 50% successful outcome. Taking A, B and C as one group the operation succeeded in 70% of the cases. As only 14 patients are classed in group II (doubtful otosclerosis and chronic adhesive process) an indication of the percentage is unnecessary. Improvement of hearing has been established in four patients operated upon. Before surgical intervention 73%

complained of a disagreeable noise in the head. After operation this had vanished or at least diminished in 71%. Postoperative otorrhoea was observed in 22%, permanent disturbances of the equilibrium in 12%, temporary disturbances in 41%. (*Excerpta Medica*, XI)

445. BECKMANN, G., Zu Aetiologie und Audiogramm der "angeborenen" Perzeptionsschwerhörigkeit. (Etiology and audiogram of the congenital hard of hearing.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(9), 1960, 566-573.

Recent audiological statistics show that insufficient attention has so far been paid to deafness arising in early foetal life, as well as that occurring at birth. American figures put the incidence of deafness after maternal rubella at the astonishing figure of 20%, while in Germany this seems distinctly rarer. The audiological curve here tends to be nearly horizontal. The commoner causes of deafness in the neonatal period are erythroblastosis foetalis, icterus neonatorum, and the asphyxial states. Audiological examination of children who had asphyxia shows only a small percentage of significant deafness (two out of 89) but the figures are higher after severe asphyxia. Audiograms in children with deafness of neonatal origin commonly show a marked high tone loss. (*Author's summary*)

446. BORIANI, V. A., and LOVO, G. F., Considerazioni su alcuni aspetti clinici della 'atresia auris congenita.' (Clinical aspects of 'atresia auris congenita.') *Ann. Laringol. Otol. Rinol. Faringol.*, Torino, 58, 1959, 447-474.

The authors describe some cases of congenital malformation of the ear; two of them were bilateral. After reference to some notions on the pathogenesis of congenital malformations of the ear, they point to the functional and aesthetic results which have been obtained. It must be observed that in the operated cases recovery of hearing has been quite satisfactory and that it remains unchanged for a long time. Plastic operations on the auricle succeeded in correcting the aesthetic defect. (*Excerpta Medica*, XI)

447. CALVERT, J., and RIBET, A., Essai de traitement des vertiges et acou-

phènes dans l'athérosclérose. (Treatment of vertigo and tinnitus aurium in atherosclerosis.) *J. franç. Méd. Chir.*, 7, 1958, 585-609.

Atherosclerosis is one of the most frequent among the causes of vertigo, deafness, and tinnitus. The authors show the importance of the influence of B-lipoproteins in the occurrence of this condition, as well as that of the increase in blood cholesterol. The authors resorted to a product called 'solvosterol,' injected i.m., which gave very good results in decreasing the cholesterol rate: 1 g. in about a week. This substance, similar to protamine, gives very promising results from a biological point of view; however, the clinical results are not so good, and the authors report improvement of headaches after treatment, an improvement of the general health in 50% of the cases, and a slight improvement of tinnitus and vertigo, but they never noted any change in deafness. On the grounds of experimental data observed in rabbits the following conclusion was reached: when all three symptoms are present, i.e., deafness, tinnitus, and vertigo, it is too late to prescribe a treatment, since by this time the lesions are irreversible. Treatment should start as soon as possible and the only means of ensuring an early detection of atherosclerosis is to carry out a thorough biological investigation of the patient. The Kunkel-phenol test, electrophoresis, dosage of total lipids, and the ultra-centrifugation of Goffman are highly considered. (*Excerpta Medica*, XX)

448. CAPELLA, G., and CASTRO, G., Consideraciones sobre la fatiga y la adaptación auditivas. (Considerations on auditory fatigue and adaptation.) *Acta O.R.L. Iber-Amer.*, 11, 1960, 321-340.

The authors define auditory fatigue as a reversible diminution in auditory acuity produced by exposures to sound according to two parameters, intensity and duration. After a review of pertinent literature and methodologies, the authors present studies performed on 74 cases representing (1) otospongiosis; (2) other transmission deafnesses (cicatrical otitis; tubal catarrh, suppurative otitis media); (3) purely perceptive deafnesses; and (4) Ménière's syndrome and menieriform pathologies. The determination of post-stimulatory fatigue is ef-

fectured by the method of Wilson. That of per-stimulatory fatigue is effected by Carhart's method in the frequencies 1024, 2048, and 4096. Recruitment is determined by the method of Lüscher. In no instance do they find a post-stimulatory fatigue threshold shift greater than 15 db, and in the majority of the cases it only measures five db. They find the greatest incidence of post-stimulatory fatigue among those with perception deafness as much among those with hypoacusia as among those with vestibular symptoms. Adaptation of the threshold is found in nearly all types of deafness and the percentage thus elevated do not typify any particular hypoacusia. Recruitment is encountered in nearly half of the cases of perception deafness, and in no case of transmission deafness. Recruitment is present as frequently in cases whose hypoacusia is associated with vestibular symptoms of central localization as in those cases of peripheral localization. The authors conclude that fatigue and adaptation are rarely associated with recruitment, that per-stimulatory fatigue does not localize the lesion, that post-stimulatory fatigue occurs most frequently in perception deafness and appears to be related to associated vestibular symptomatology, and that recruitment is present in perception deafness with or without vestibular symptomatology, indicating a nerve lesion, but it is very difficult to assign it a specific role of exclusively cochlear localization. (M.S.W.)

449. CODY, D. T. R., and WILLIAMS, H. L., Cogan's syndrome. *Laryngoscope*, 70, 1960, 447-478.

The vestibular and auditory components of the rare Cogan's syndrome 'consist of severe vertigo, tinnitus, nystagmus, ataxia and progressive bilateral sensory-neural deafness,' with the possibility of 'remissions and exacerbations.' There is also non-syphilitic interstitial keratitis, usually bilateral, 'characterized by rapid remissions and exacerbations and may or may not lead eventually to diminution of visual acuity.' The authors present their own case reports and evidence from the literature to show that Cogan's syndrome may only be one manifestation of a larger disease entity, periarthritis nodosa. (R.G.)

450. EBIHARA, I., TAKAYASU, S., and IKEDA, H., A rare case of Heerfordt's

disease complicated by bi-lateral perceptive deafness. (Japanese text) *J. oto-rhino-laryngol. Soc. Jap.*, Tokyo, 62(7), 1959, 1568-1572.

The authors report a case of so-called Heerfordt's disease in which the principal clinical findings are uveitis, parotitis and occasionally facial palsy, lymphadenitis, and dermatitis. Bilateral perceptive deafness was also observed in this case. This patient was a male, 15-yr.-old, and the clinical findings were as follows: When the above-mentioned principal clinical findings developed moderately in severity, his hearing loss began to appear and subsequently aggravated gradually. Examination one month after the onset of these symptoms revealed normal tympanic membranes and bilateral retro-labyrinthine perceptive deafness which showed about 25-35 db loss in a range of 500 cps to 2,000 cps and about 45-55 db loss of 3,000 cps to 8,000 cps with no recruitment in the DL test. By cortisone therapy these otological findings were improved parallel with the other symptoms, and they disappeared almost two months after the start of the therapy. The localization of this lesion may be considered as in the internal auditory canal including the ganglion geniculi, because the above-mentioned clinical findings are complicated by dysgeusia and slight meningeal symptoms. The case report of Heerfordt's disease complicated with bilateral perceptive deafness was not found in a review of the literature. (*Excerpta Medica*, XI)

451. FOWLER, E. P., Deafness from mumps (Guest Editorial). *Arch. Pediat.*, 77, 1960, 243-246.

Deafness caused by mumps is well known and the inner ear lesions have been described. Infectious perotitis is a spotty, systemic disease of the body, although it may and often does apparently affect only one parotid gland. Its symptoms may be severe or so trivial that they are not noticed either by the child or his parents. Pediatricians should alert mothers and nurses to the possibility of mumps deafness and caution them to test the child every day for two weeks after the onset of mumps. This can be done by having the child listen to the ticking of a watch held near one of his ears while the other ear is occluded. Unrecognized mumps can cause

severe deafness, frequently even total deafness. Fortunately this deafness usually affects only one ear. Blocking of the auditory artery by a white or red embolus or thrombus caused by mumps virus would explain the pattern of the disease and probably the fact that the disease is usually unilateral. It is known that intravascular agglutinates can be influenced by heparin which is an anti-inflammatory agent. Heparin has been used without harm with little children and it is recommended in cases of mumps deafness which have been detected early. Nicotinic acid, intravascular procaine, and nitroglycerine under the tongue are discussed as treatments. (M.N.)

452. FREEMAN, M. S., and FREEMAN, R. J., Serous otitis media. *Amer. J. Dis. Child.*, 99, 1960, 683-687.

The incidence, etiology, classification, and treatment of serious otitis media are briefly but clearly presented. A hearing loss is often the first indication of this disease in children. References are made to a number of studies and recent articles that indicate the disease is more prevalent and serious than is commonly thought. The authors believe the incidence is increasing largely because of the frequent and indiscriminate use of antibiotics and the increase in allergy. They regard adnotonsillectomy and myringotomy as still being '... the keystone in the treatment of this disease.' It is concluded that 'further education of the medical profession is necessary because serous otitis media is a serious disease with widespread social and economic effects upon the patient.' (J.L.S.)

453. GARCIA, IBÁÑEZ, L., Un nuevo sistema audioquirúrgico: la sonoinversión. *Nota previa.* (A new audiosurgical system: sound inversion. Preliminary report.) *Rev. Espan. Oto-Neuro-Oftalmol. Neuro-Cirug.*, Valencia, 18(102), 1959, 73-76.

Sound inversion is a method which aims at making it possible to perceive the sound wave through the isolated fenestra rotunda while the fenestra ovalis or the new surgical or pathological fenestra of the vestibular canal plays the role of a passive hydraulic counter-fenestra behind an air cushion ventilated by the eustachian tube. According to the lesions it will be easier to reconstruct a hypotympanic pneumatic cushion

protecting the fenestra rotunda or to isolate the fenestra ovalis behind an air space above the promontory thus creating sound inversion. Its principal indication is otorrhoea with non-utilized tympanic vestiges and extensive fungous lesions of the hypotympanum and the region of the fenestra rotunda when the transforming mechanism of the ear cannot be restored. The author tested a new method of so-called closed fenestration associated with exclusion of the fenestra rotunda in order to obtain sound inversion. The new fenestra ovalis is converted into a counter-fenestra and the antro-attic cavity may close by first intention. It suffices to close the labyrinth by a periosteal flap or graft. In otosclerosis (operation of the Cornelli-Herberts type or Rosen's fenestra), sound inversion also makes it possible to create the adequate difference of phase and to reach a higher audible threshold. (*Excerpta Medica*, XI)

454. GOODHILL, V., Pseudo-otosclerosis. *Laryngoscope*, 70, 1960, 722-757.

Several varieties of tympanic lesions are capable of producing otologic and audiological conditions resembling otosclerosis. 'Among the pseudo-otosclerotic lesions are fibrotic states of the tympanic cavity, tympano-sclerosis, Paget's disease (osteitis deformans), fragilitas ossium (osteogenesis imperfecta). . . ' These lesions are 'exemplified by case reports and audiograms.' (R.G.)

455. HAHNBROCK, K. H., Neuere Gesichtspunkte bei der Versorgung von Trommelfellverletzungen. (Modern points of view in the care of injuries of the tympanum.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(5), 1960, 304-310.

In all recent and also older ruptures of the tympanic membrane a microscopical search for membrane remnants must be made to bring these into their original position. The scarred and epithelialized edges of chronic perforations should be excised, not cauterized, and the larger defects covered with free skin grafts. (*Author's summary*)

456. HALLBERG, O. E., Therapy of sudden labyrinthine deafness. *Laryngoscope*, 70, 1960, 408-415.

The author believes that most cases of sudden deafness are due to vascular acci-

dents. The treatment of choice is 'large doses of nicotinic acid and a diet low in saturated fats.' This kind of treatment so far has not been very successful, possibly because the patient may have delayed too long in seeking help. (R.G.)

457. HENNER, R., GUILFORD, F. R., SHEA, J. J., and JEANTET, C., *Histopathology of the otosclerotic footplate. Laryngoscope*, 70, 1960, 506-522.

Histopathologic studies were made of 120 stapedial footplates removed from otosclerotic patients in the Shea procedures for fenestrating the oval window during surgery for the improvement of hearing. The studies provide bases for classifying four types of otosclerotic bone which reflect the state of activity of the otosclerotic process. From their findings and from the literature the authors conclude that 'otosclerosis can be considered as another genetic tissue disease wherein the advancing vascular buds lay down sparse abnormal fibrillar substance and excess cementum.' (R.G.)

458. HJORTH, S., LUNDBORG, T., and ROSLER, G., *Zum Schalleitungsmechanismus des Mittelohrs. Eine anatomische und praktische klinische Studie in Normalfälle und bei verschiedenen pathologischen Veränderungen.* (The conductive mechanism of the middle ear. An anatomical and practical-clinical study in normal cases and in several pathological conditions.) *Acta oto-laryngol.*, Stockholm, 50(5), 1959, 423-437.

In a study of the structure of the conductive mechanism of the middle ear, a series of 100 temporal bones was examined in detail. For this purpose small preparations of the middle ear were made having, around the tympanic cavity, a remaining osseous wall substance of only one or two mm. thickness. Thus it was possible, from particularly favorable inspection points, to make photos of the elements in the middle ear. Some preparations were also embedded in a transparent plastic solution making it possible to have sections in every interesting plane with preservation of the original position of the different elements of the middle ear. In connection with these preparations the ossicular chain and its ligament suspensions are described and considered. To-

gether with this anatomical-functional investigation, there is, in the second part, a schematic review of sound transmission in the middle ear with especial reference to hearing restoration. A couple of different lesions in the conductive mechanism in various pathological conditions are also discussed. Finally there is a short collocation of different operative possibilities in hearing restoration. (*Excerpta Medica*, XI)

459. HLADKÝ, R., *Vztah operačních a pooperačních změn při fenestraci laterálního kanálku k trvalému sluchovému zisku.* (The relationship of operative and postoperative changes after the fenestration of the lateral canal and permanent auditory gains.) *Čsl. Otolaryngol.*, 8(5), 1959, 293-300.

The author's analysis showed that for permanent auditory gain it is of importance where the new opening has been made and what its properties are. An opening with an anterior localization above the ampulla, sufficiently large, of regular shape and smooth edges proves most satisfactory. Bone dust, bone fragments, and sedimentation of blood cells or haemorrhage into the canal, impairment of the membranous labyrinth of different degrees, damage of the tympanomeatal lobe, etc. have a secondary influence and the degree of damage or the combination of different types of damage plays a more important role. Solutions used during operation for rinsing the trepanation cavity exert no influence on the permanent auditory gain. Among the postoperative causes the greatest attention should be paid to hydrops of the labyrinth and serious labyrinthitis, but not even these conditions alone are the main danger as far as the loss of auditory gain after the fenestration of the labyrinth is concerned. Further investigations of this problem are needed and further yet unknown causes must be sought causing losses of auditory gain after the fenestration of the labyrinth. (*Excerpta Medica*, XI)

460. HYBÁŠEK, I., KRČ, C., and HUBÁČEK, J., *Pozdní rentgenové nálezy u antrotomovaných.* (Late radiographical findings in antrotomized ears.) *Československá Otolaryngol.*, Prague, 9(5), 1960, 277-282.

The authors deal with the problem of pneumatization of the process from the

standpoint of its new development after antromastoidectomy. By X-ray examination of 192 ears operated on eight to eleven years previously they found neofornication of pneumatized structure in the trephined process in 43% of cases. Repneumatization was dependent on the age at which the operation was performed and on the time of healing. Most frequently it developed in operated babies with the three weeks' duration of healing of the wound and of the middle ear, in 59%. The new formed pneumatization was in many cases identical with the normal pneumatization of the non-operated ear. Repneumatized ears had good hearing in 94% of cases. (*Author's summary*)

461. JUERS, A. L., Clinical aspects of tympanic sound conduction. *Laryngoscope*, 70, 1960, 1244-1255.

(1) The major function of the normal tympanic conduction mechanism is to provide a favorable areal ratio [normally about 14:1] between the tympanic membrane and the stapes. Lesser functions are to provide sound protection to the round window and a lever action. (2) Early elasticity and mass lesions produce different air conduction curves with converging and diverging air-bone gaps respectively. (3) In a fenestrated ear and in a myringostapedioplasty with a low areal ratio, the round window sound protection function of the tympanic membrane assumes greater importance. (4) In an ear with a good areal ratio, thin middle ear effusion decreases hearing chiefly by its mass effect. In an ear with a low areal ratio, middle ear effusion decreases hearing chiefly by its phase difference decreasing effect. (5) In an otherwise normal conduction mechanism, tenacious middle ear effusion filling the entire middle ear will decrease hearing because of its mass effect, elasticity increase, as well as phase difference decreasing effect. (6) Tympanic perforation in an otherwise normal conduction mechanism causes a hearing loss primarily because of a decrease in areal ratio. Loss of round window protection is of secondary importance in this situation. (7) An unusually large air-bone gap in the presence of an intact tympanic membrane is suggestive of ossicular chain interruption, particularly if there is a history of previous mastoid surgery or head trauma.

(8) The total displacement of the cochlear structures is dependent on the summation of several factors which influence maximum pressure differences possible at the inner surface of the two windows. These factors include the elasticity and mass of the conduction structures, areal ratio and phase difference increase or decrease effect of structures and media through which sound passes en route to the two windows. (*Author's summary*)

462. KELEMEN, G., Histocytosis involving the temporal bone (Letterer-Siwe, Hand-Schueller-Christian.) *Laryngoscope*, 70, 1960, 1284-1304.

Serial sections were studied of a temporal bone of a 26-month-old child with 'eosinophilic granuloma, who died during the Letterer-Siwe and the Hand-Schueller-Christian phases.' The disease affected the external ear and the middle ear, and the petrous apex. The otic capsule, the membranous labyrinth, the modiolus and the internal auditory meatus were spared. No mention is made of possible hearing problems. (*R.G.*)

463. KLEY, W., Ursachen der Recidiv-perforation nach Tympanoplastik. (Causes of the recurrence of perforation after tympanoplasty.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(7), 1960, 438-443.

Perforations may recur after tympanoplasty in the early stages of healing or late, after the ear has healed completely. Both varieties may have a common origin (tubal and haematogenous infection of the middle ear, allergic inflammation and trauma). However, each sort has its own typical causes. The early perforation is often due to excessive thinning of the graft, graft necrosis due to inefficient circulation, and dehiscence at the edges. Late perforations tend to be associated with epithelial and talc cysts, ulcerating or granulating dermatitis and instability of the graft. (*Author's summary*)

464. KOTYZA, F., and MENŠIKOVÁ, Z., Akutní otitis media sdružená s těžkými cévními nitrolebními komplikacemi. (Acute otitis media accompanied by severe intracranial vascular complications.) *Československá Otolaryngol.*, Prague, 9(5), 1960, 303-309.

A 60-year-old female showing slight symptoms of acute catarrhal haemorrhagic otitis media on the right side developed variegated symptoms of involvement of the central nervous system (left hemiparesis, the meningeal syndrome, symptoms of left cerebellar lesion, etc.). Mastoidectomy and petrotomy according to Ramadier-Přecech-těl was performed in the patient. Thrombosis of the vena jugularis int., of sinus sigmoideus transversus and superior and subdural haematoma of the right side, thrombosis of the subclavia artery based on arteriosclerosis, embolism of the arteria subclavia and arteria vertebralis, white encephalomalacy of the cerebellar hemisphere and the conus temporalis of the left side were found at post mortem. The authors analyze the symptoms of this disease from the otological and neurological standpoint (together with analysis of the electroencephalography). They arrived at the conclusion that the leftsided cerebellar malacia and the subdural haematoma over the right cerebral hemisphere could not be safely ascertained clinically. (*Authors' summary*)

465. KOVÁŘ, M., and POLÁK, O., *Poruchy sluchu způsobené onemocněním spánkového laloku*. (Impaired hearing caused by lesions of the temporal lobe.) *Československá Otolaryngol.*, Prague, 9(4), 1960, 212-217.

The authors describe changes of hearing in four patients suffering from confirmed lesions of the temporal lobes of the subordinated hemisphere. (1) The threshold of hearing for pure tones was slightly reduced in three patients, one patient suffered from unilateral perception deafness. (2) Three patients suffered from marked acoustic hyperaesthesia. In its development probably the facilitation of acoustic stimuli with an increased excitability and potentiated spasticity, confirmed by EEG, played a role. (3) In audiometric examination of speech the threshold of perception of speech corresponded to small tone losses. (4) Thermal noise of 70 db added to the audiometric set-up, lowered the threshold of speech perception substantially more than in healthy individuals with normal hearing. (5) Three patients had suffered for many years before operation from a

speech disorder, including two who stuttered. (*Authors' summary*)

466. LINDSAY, J. R., PROCTOR, L. R., and WORK, W. P., *Histopathologic inner ear changes in deafness due to neomycin in a human*. *Laryngoscope*, 70, 1960, 382-392.

Histopathologic studies were made of the temporal bones of a 50-year-old man who died about 15 months after having sustained nearly a total bilateral hearing loss as the result of neomycin therapy. The inner hair cells were nearly totally absent. The outer hair cells also showed degeneration throughout but to a lesser extent. Supporting structures also showed some degeneration. Peripheral cochlear neurons were preserved, as were vestibular sensory epithelium and vestibular function. (R.G.)

467. MODICA, V., and VITTO-MASSEI, P., *Indagine sulla distribuzione dei gruppi sanguigni in pazienti affetti da otosclerosi*. (Study of the distribution of the blood groups in otosclerosis.) *Clin. Otorino-Laryngol.*, 11(3), 1959, 240-249.

The authors, after a brief study of the data indicating on the one hand the importance of the constitutional aspects in otosclerosis, and on the other hand that of the blood groups in various pathological conditions, refer the results of their studies conducted on blood groups of 70 otosclerotic patients; while non-variation was noted in respect to the controls for the system ABO, an increase from 10% to 20% of Rh negative, subgroup D, in the otosclerotics in respect to the controls was noted. Although they express their reserve, they advance the hypothesis that the Rh-negative group subjects are more prone than the Rh-positive subjects, to those alterations causing otosclerosis, without defining whether it is due to a particular constitutional change which indirectly causes an otosclerotic process or whether it is a matter of a more marked frequency of the alterations at the base of the ear. (*Excerpta Medica*, XI)

468. MYERS, D., WINCHESTER, R. A., SCHLOSSER, W. D., *Otosclerosis surgery for the older patient*. *Geriatrics*, 15, 681-692.

The estimate that 75-80% of all deaf and hard of hearing people in the United States are 50 years of age or older recognizes presbycusis as the most frequent cause of hearing difficulty. There are, nevertheless, many older persons who have otosclerosis, amenable to recent surgical advances. The authors favor anterior crurotomy for the older patient who has localized sclerotic bone or in whom the otosclerotic process is inactive. Fenestration of the oval window is used for persons with signs of active bone formation or who have advanced otosclerotic involvement. In a series of 775 patients who had stapes mobilization procedures in a five year period 77 (10%) were 50 years of age or older. Results obtained in the older population were comparable to those of the larger series, presented in parenthesis: reaching the 30 db level or better, 45% (48%), gaining 11 db or more, 66% (63%), losing six db or more, 5% (7%). Thus, age per se is not an important factor in selecting candidates for otosclerosis surgery, even though results will be adversely affected by disordered cochlear function reflected in recruitment, poor speech discrimination or tolerance problems. (J.C.S.)

469. NEIGER, M., Tympanoplastische Eingriff nach früherer Radikaloperation des Mittelohres. (Tympanoplasty after radical operation.) *Pract. Oto-Rhino-Laryngol.*, Basel, 22(4), 1960, 278-285.

Tympanoplasty was performed on seven patients who had a radical operation performed many years previously and whose cavities continued to discharge. The second operation was carried out for the following two reasons: firstly, because the aural discharge could not be stopped with conservative treatment and secondly, because there was good hearing by bone conduction suggesting a good chance of improvement in hearing. In all seven cases the ear has remained dry since the operation, in three cases there was marked improvement in hearing, and in one case slight improvement. Worsening of hearing has not occurred in any of the seven cases. (Author's summary)

470. NIKITINA, V. F., Surgical therapy of patients with otosclerosis by the method of stapes mobilization. (Russian

text) *Vest. Oto-Rhino-Laryngol.*, Moscow, 21(6), 1959, 39-48.

An analysis of surgical therapy of 125 otosclerosis patients, operated by the method of stapes mobilization, is presented. An improvement in hearing was attained in 54 patients. The patients were subdivided into four groups according to indications. A good result was noted in the group of patients with indications of the 1st and 2nd degree: the hearing improved in 22 out of 31 patients; those with indications of the 3rd degree—in 19 out of 51; those with indications of the 4th degree—in 13 out of 43. (*Excerpta Medica*, XI)

471. RICHTNER, N. G., Reconstructive micro surgery of the ear, especially with the cavum minor technique. *Laryngoscope*, 70, 1960, 1179-1191.

When the ossicular chain has been seriously affected by chronic middle ear disease, the Wullstein Type IV tympanoplasty is used in the attempt to improve hearing. In this procedure a small pouch or *cavum minor* is established for the purpose of providing a pressure differential between the round and oval windows. About half of the cases show a mean gain of 22 db, which is maintained (or improved) for at least one year post-operatively. Only a few of the patients who showed no improvement had poorer hearing after surgery. (R.G.)

472. RIESCO-MacCLURE, J. S., and STROUD, M. H., Dysrhythmia in the post-caloric nystagmus. Its clinical significance. *Laryngoscope*, 70, 1960, 697-721.

Dysrhythmia in nystagmus induced by caloric stimulation indicates damage to cerebello-vestibular relations caused by tumors of the midline structures in the posterior fossa of the brain stem. Hearing is characteristically normal in patients so affected. (R.G.)

473. RITTER, F. N., and LAWRENCE, M., Reversible hearing loss in human hypothyroidism and correlated changes in the chick inner ear. *Laryngoscope*, 70, 1960, 393-407.

Two cases of hypothyroidism with associated perceptive deafness have been described. Treatment with thyroid in one instance and cessation of the administration

of a drug inhibiting thyroid activity in another reversed this hearing loss. Experiments conducted by injecting thiourea into fertile chick eggs at a very early stage of development showed, at the age of hatching (21 days of incubation), marked hypertrophy of the thyroid gland and edema in the area of the sensory supporting cells of the acoustic papilla. The possible relationship between the occurrence of this edema and the reversibility of the hearing loss is discussed. (*Authors' summary*)

474. RÜEDI, L., *Die Interpositionschirurgie zur Behandlung der otosklerotischen Schwerhörigkeit*. (Techniques of the interposition operation in otosclerotic deafness.) *Pract. Oto-Rhino-Laryngol.*, Basel, 22(5), 1960, 410-420.

As the permanent results of stapes mobilization are not entirely satisfactory, the technique of the interposition operation as suggested by J. J. Shea and M. Portmann should be considered in the treatment of otosclerotic deafness. The various methods of the operation are briefly described. The operation practiced in Zurich is based on Portmann's technique and is described in detail. The operation was successful in 70 out of 73 cases. In the 70 cases the average hearing gain in the speech frequencies was 29 db. The post-operative air-bone gap was only 13 db in the speech frequencies. After only 11 months, assessment of the permanent results is not at present possible. (*Author's summary*)

475. SCHUKNECHT, H. F., and TONNDORF, J., *Acoustic trauma of the cochlea from ear surgery*. *Laryngoscope*, 70, 1960, 479-505.

It is well known that high energy acoustic signals, such as those created by a blast in air or a blow to the head, can cause cochlear damage having its maximal effect in the upper basal turn. Such lesions can also be created by manipulation of the stapes during the course of surgical procedures. The amplitudes of such maneuvers can be very large and the time constants are long. The resulting cochlear injuries are identical to those resulting from stimuli having short time constants. Animals with experimentally produced footplate fractures frequently sustain rupture of the saccule, as well as injury to the upper basal and

lower middle turns of the cochlea. Saccular rupture also occurred in one of ten animals subjected to head blows. The cause for the saccular injury is not clear. A new concept is developed concerning the mechanism of acoustic trauma. The assumption is made that the ensuing tissue damage is a function of the physical stress resulting from acoustic stimulation. Experiments on cochlear models using transient signals indicate that the closer the stress is concentrated to the basal end of the cochlea the shorter is the time constant of the applied signal. Since the sensitivity of the model falls off for signals with very short time constants, a region of optimal stress develops close to but not directly at the extreme basal end of the cochlea. It is possible that signals of relatively long time constants, but of very large amplitudes, produce injurious stresses in the basal region of the cochlea due to nonlinear distortion. (*Authors' summary*)

476. SCHUKNECHT, H. F., McGEE, T. M., and OLEKSIUK, S., *Comments on tympanoplasty*. *Laryngoscope*, 70, 1960, 1157-1168.

Reconstructive middle ear surgery is usually unsuccessful in the presence of the Eustachian tube malfunction, hyalinized collagen deposits, and deficient mucous membrane; ordinarily it should not be performed for patients over 60 years of age. Skin graft failures can occur immediately, or many months after surgery. Graft failures can be decreased by the proper selection of the donor site, careful handling and approximation of the graft to the recipient site, use of cutting burrs only, and by controlling suppuration. (*Authors' conclusions*)

477. SHEEHY, J. L., *Vasodilator therapy in sensory-neural hearing loss*. *Laryngoscope*, 70, 1960, 885-913.

The clinical findings in 247 patients with sudden and fluctuating sensory-neural hearing losses are presented. A vasodilator regime is outlined and was instituted in 79 of these patients. The results of this treatment are presented. Although no conclusions have been drawn as to the etiology in these cases, treatment based on the assumption that vascular spasm is fundamental in their development has resulted in recovery of hearing in approximately

50 per cent of the cases treated within six weeks of onset of the loss. (*Author's summary*)

478. SULLIVAN, J. A., Tympanoplasty. *Laryngoscope*, 70, 1960, 1168-1178.

The author traces the development of tympanoplasty and presents his rationale for the surgical techniques that he advocates. Eradication of disease has priority over restoration of hearing. (R.G.)

479. SZPUNAR, J., Differences in hearing after total tympanoplasty due to presence or absence of crura of stapes. *Arch. Otolaryngol.*, 72, 1960, 96-101.

Two groups of patients who had undergone total tympanoplasty were selected for study. All cases had been operated on from one to four years prior to selection for the study. Following the removal of the two outer ossicles and the surgical bridge, a large skin graft was placed so as to cover the whole middle ear. The average loss for the 500-2000 cps range was 26.3 db for group I and 29.7 db for group II. The two groups were markedly similar in terms of audiometric contour. The absence of the stapes resulted in a small drop in hearing in the low and middle frequencies, but a mean improvement in hearing of 6 db at 8000 cps. The results of the study indicate that in successfully operated cases with total tympanoplasty the presence or absence of the head and crura of the stapes does not influence hearing levels appreciably. (J.J.)

480. TABB, H. G., Closure of perforations of the tympanic membrane by vein grafts. A preliminary report of twenty cases. *Laryngoscope*, 70, 1960, 271-286.

An operative technique is described for closing large, long-standing perforations of the tympanic membrane by means of vein grafts. The average improvement in air conduction hearing level in five selected cases ranged from 20-25 db at low frequencies to 5-10 db at high frequencies, bringing thresholds within normal range for all frequencies. (R.G.)

481. TOLSTOV, Y. P., Impairment of hearing and vestibular function in brucellosis. (Russian text.) *Vest. Oto-Rino-Laryngol.*, Moscow, 21(6), 1959, 24-29.

One hundred and three patients with brucellosis were under investigation. Impairment of hearing due to brucellosis was noted in 29 patients. Affection of the middle ear was observed in three cases, that of the internal ear in 25. The impairment of hearing in one patient, which ensued following an exacerbation of brucellosis, was of transitory nature. Six of the 25 patients had otosclerosis and four bilateral deafness. The impairment of hearing may occur suddenly, usually in the chronic stage of brucellosis. The incidence, severity and duration of affection of the acoustic nerve give grounds for singling it out as a symptom of brucellosis. Disturbance of the vestibular function was observed in eight patients, expressed predominantly by inhibition of the latter. (*Excerpta Medica*, XI)

482. TROTTER, W. R., Deafness and thyroid dysfunction, *Brit. Med. Bull.*, 16(2), 1960, 92-98.

Hearing loss may occur in three types of thyroid disorder: adult myxoedema, endemic cretinism, Pendred's syndrome. In about half the cases of myxoedema, mild hearing loss (perceptive, conductive, or mixed) may be due to causes other than thyroid deficiency. In endemic cretinism a severe perceptive loss of acuity is accompanied by anatomical changes which are greater, strangely enough, in the middle ear, than in the inner ear—probably occurring in pre- or neo-natal life. Introduction of iodized salt reduced to one-fourth the incidence of deaf-mutism in areas of goiter and hypothyroidism. In Pendred's syndrome, involving a bilateral, perceptive hearing loss with a sloping audiometric configuration, pathology is present not in the middle ear but in the inner ear or C.N.S. Pendred's syndrome, genetically transmitted by a recessive gene, probably accounts for 5-10% of all cases of congenital deafness. (J.C.S.)

483. VAN DISHOECK, H. A. E., DERKS, A. C. W., and VOORHORST, R., Bacteriology and treatment of acute otitis media in children. *Acta oto-laryngol.*, Stockholm, 50, 1959, 250-262.

From the observation of about 500 children suffering from otitis media it appeared that germs obtained by sterile puncture

from children suffering from a first attack were the same as those found in the nasopharynx. These were chiefly the pneumococcus and the haemophilus. In chronic otitis on the contrary the middle ear becomes part of the body surface, with a corresponding flora of staphylococci and faecal germs. Improper treatment of a first attack by eardrops will further the ingression of staphylococci into the middle ear, thus aggravating the illness. The remarkable fact was established that in these ears, wrongly treated with eardrops, relapses caused by staphylococci were frequent. If by proper antisepsis in the first attack contamination is prevented, not only is the recovery time shortened from 17 to seven days, but also relapses and complications diminish considerably. Broad-spectrum antibiotic treatment of the first attack is of consequence only in haemophilus infection, diminishing the number of relapses, notwithstanding a slight lengthening of the recovery time. (*Excerpta Medica*, XI)

484. VESELL, E. S., Symphalangism, strabismus, and hearing loss in mother and daughter. *New Eng. J. Med.*, 263, 1960, 839-842.

Symphalangism is a term for the absence of a joint between the proximal and middle phalanges. In one English family, this defect has been traced back fourteen generations to the first Earl of Shrewsbury who was born in 1390. Symphalangism is inherited as an autosomal dominant. The two cases presented here are unique in additionally exhibiting strabismus and hearing impairment. Detailed case histories are presented for the 33-year-old mother and her 13-year-old daughter. The triad of symphalangism, strabismus, and hearing loss has not been previously described. It may represent the coincidental occurrence of three unrelated heritable defects transmitted by different genes. The possibility is discussed that a single genetic defect produced the digital and ear abnormalities. (*M.N.*)

485. VILA, P. A., and VILADIU, J. M., La hipoacusia en las enfermedades de Lobstein y de Paget. (Hypoacusia in Lobstein and Paget's diseases.) *Acta O.R.L. Iber.-Amer.*, 11, 1960, 157-166.

... In Paget's disease one finds a mixed

deafness with the absence of recruitment in the perceptive compound. They suggest the possibility of pagetic injuries in the ossicular chain, along with the classical alteration of the acoustic nerve through compression or elongation. In Lobstein's disease they find a stapes ankylosis syndrome which, however, appears quite movable during the surgical revision. The osteodystrophic focus must be found beyond the footplate of the stapes, preventing the sound transmission to the round window. (*Authors' précis*)

486. WEBER, I., Ein Beitrag zu den kryptogenen Hörstörungen des Innenohres. (Treatment of undetermined hearing disturbances of the inner ear.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(9), 1960, 589-595.

Experimental treatment with penicillin or other antibiotics in 25 patients gave the impression that it may arrest or interrupt the focal process in acute disturbances of hearing. The antibiotic probably does not affect the inner ear itself, but acts on a general or focal inflammatory process. It is therefore not advocated as the sole therapeutic agent. But it does appear to be valuable when used at once and in association with other measures in the treatment of acute disturbances of hearing. (*Author's summary*)

487. WULLSTEIN, H. L., KLEY, W., RAUCH, S., and KÖSTLIN, A., Zur Biochemie der Perilymphe operierter Otosklerosen. (Biochemistry of the otosclerotic's perilymph.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(10), 1960, 665-671.

The sodium and potassium values and the content of alkaline phosphatase were investigated in the perilymph of cases of otosclerosis which underwent surgery. The sodium and potassium levels proved unchanged; the content of alkaline phosphatase showed an increase which could not be found in the blood serum. A theoretical explanation of these findings is given. (*Authors' summary*)

HEARING AIDS

488. DeARDISSONE, M. B., and ARDISSONE, E. T., (h.), Un sistema de ampli-ficación adicional en la educación del sordo.

(A system of additional amplification in the education of the deaf.) *Fono Audiologica*, 6, 1960, 109-112.

The authors present a simple plan for providing classroom quality amplification on the playground. By their procedure, a loop of TV antenna wire is substituted for the earphones of the classroom amplifier. This loop is strung around the playground. The children wear standard earphones plugged into a small box containing a battery powered three transistor amplifier. The signal from the classroom amplifier creates a magnetic field about the playground and a telephone coil coupled to the first stage of the transistorized amplifier receives the signal. This scheme obviates power losses due to distance which would be experienced with the ordinary hearing aid, and extends the range of activities pursued with supervised amplification. [This equipment, which has been in use in Wiesbaden, Alemania, since 1959, resembles the American-made Jay Warren 'Walk-away' classroom amplification equipment in its magnetic loop operational mode.] (M.S.W.)

489. Di CARLO, L. M., and BROWN, W. J., The effectiveness of binaural hearing for adults with hearing impairments. *J. and Res.*, 1, 1960, 35-76.

The purpose of this study was to explore the comparative values of binaural, pseudo-binaural, and monaural listening in hearing impaired individuals with conductive, mixed, or sensory-neural losses. Sixty hard-of-hearing individuals who were experienced hearing aid users were used as the experimental group and twenty normal hearing adults served as controls. The three types of amplification were used to determine speech reception thresholds, discrimination scores, speech/noise ratios, and localization. The following results were obtained: (1) binaural listening provided a slight lowering of the speech reception threshold as compared with the pseudo-binaural and better monaural thresholds, with the greatest difference (5.8 db) demonstrated by the conductive group; (2) discrimination scores were not significantly different for any of the listening conditions; (3) there was very little difference in speech/noise ratios between the different

listening conditions and between groups, and (4) binaural amplification was superior to either pseudo-binaural or monaural listening for localizing a noise source. In general, the experimental group subjectively preferred monaural to binaural listening for the tasks required in this investigation. (P.A.Y.)

490. FOWLER, E. P., Bilateral hearing aids for monaural total deafness. *Arch. Otolaryngol.*, 72, 1960, 41-42.

If the individual with monaural total deafness wears his hearing aid on his good side he may be missing much information due to the placement of the microphone. Sounds coming from the contralateral side may not be heard. It is suggested that this situation can be rectified either through the use of a bone conduction oscillator, if bone conduction is good in the hearing ear, or through the use of two microphones with a single hearing aid. One of the microphones would be mounted on the dead ear, but connected to the hearing aid worn in the good ear. (J.J.)

491. HAYDEN, G. D., The crossbar (polyethylene) prosthesis for the improvement of hearing. *Laryngoscope*, 70, 1960, 1330-1335.

A polyethylene prosthesis with a stabilizing bar can act as a good transmitter for the improvement of hearing in Type IV tympanoplasties. The maintenance of its position and the improvement of hearing can be enhanced by removal of the footplate even when mobile. The same type of prosthesis has also proved successful in improving the hearing in certain patients who have previously undergone a fenestration of the semicircular horizontal canal and who still have a good cochlear nerve response but who failed to regain or maintain useful hearing. (Author's summary)

492. INGALL, B. I., Discussion on the use of hearing aid equipment in schools for the deaf. *Teach. Deaf*, Birmingham, 58, 1960, 239-243.

The use and care of three main types of amplifying equipment used in schools for the deaf are discussed—(1) main-powered amplifier, (2) induction loop, and (3) individual acoustic aids. The wider frequency range and greater output of the

amplifier in contrast to freedom of movement and elimination of impeding headset offered by the induction loop are considered. A full time technician to service amplifiers and individual aids in every school for the deaf is recommended. It is considered essential that teachers 'should begin with the assumption that all the new admissions have considerable amounts of hearing—regard them as potentially partially deaf and then proceed to find how much hearing they actually have after they have had a lot of opportunities to listen to amplified sound.' (M.S.K.)

493. JEFFERS, J., Quality judgment in hearing aid selection. *J. speech hearing Dis.*, 25, 1960, 259-266.

Thirty-two subjects with conductive type losses were asked to judge the quality of speech reproduced by five different vacuum type hearing aids arranged in pairs for comparison. The hearing aids used were chosen as typical of differences in acoustic characteristics found in wearable hearing aids. They represented a range from the best to the poorest characteristics. Only subjects with conductive type losses were used because they could be assumed to have no inner ear distortion which might affect their judgments. The results showed: (1) that the 'typical' acoustic differences in the hearing aids were sufficient to result in real differences in the quality of the reproduced speech and (2) that the subjects were excellent judges of these differences. They were able to select with amazing speed and certainty the aid from any given pair with the better acoustic characteristics. (Author's summary)

494. McCONNELL, F., SILBER, E. F., and McDONALD, D., Test-retest consistency of clinical hearing aid tests. *J. speech hearing Dis.*, 25, 1960, 273-280.

The present study was conducted to determine the test-retest reliability of speech audiometry measures with hearing aid wearers randomly selected in a routine clinical situation. Subjects for the first portion of the study included 40 subjects on whom aided discrimination scores and speech reception thresholds were obtained twice on the same day. A second group of 37 subjects was used to yield similar repeat data from tests performed from two

weeks to three months after the first test. Speech discrimination scores were found to have a markedly high degree of test-retest consistency in both test conditions as well as when the results obtained by one audiologist were compared with those obtained by other clinicians. Coefficients of correlation for discrimination tests ranged from .83 to .92. Aided speech reception thresholds were less consistent on repeat testing, with correlations ranging from .48 to .68. No significant difference was found between test results from both types of measures when tests were administered by different clinicians. In one of three comparisons involving test order, a significant difference between means was obtained in favor of results from the second test. (Authors' summary)

495. MILLER, A. A., McCAULEY, J. M., FRASER, C., and CUBERT, C., Psychological factors in adaptation to hearing aids. *Amer. J. Orthopsychiat.*, 29, 1959, 121-129.

Case material is presented to illustrate some of the psychological factors related to the problem of adaptation to a hearing aid. Success or failure of adaptation is related to cultural, social and intrapsychic factors, as well as to mechanical ones. (Psychol. Abst.)

LANGUAGE AND COMMUNICATION

496. ANDERSON, F., An experimental pitch indicator for training deaf scholars. *J. acoust. Soc. Amer.*, 32, 1960, 1065-1074.

Information related to the subjective pitch of a sound in running speech is displayed in terms of time on a revolving cathode-ray tube. One advantage claimed for this device over a visible speech translator is that the new apparatus discards certain unwanted information in order to simplify the graphical display for purposes of teaching deaf children. The circuit is given in the article and certain deficiencies are discussed. The apparatus in question was developed at a school for the deaf in South Africa. (B.A.L.)

497. BERNADINE, SISTER ANNE, Let's increase their vocabularies. *Volta Rev.*, 62, 1960, 218-219.

This article suggests a wide variety of words used by the eighth grade teacher in the classroom for deaf children that have the same meaning as the word 'said.' For example: muttered, teased, declared, hissed, etc. It is suggested that children must be taught the meaning of such words and how to use them in a sentence. Learning the meaning is not difficult but using them correctly in a sentence proves to be more so. Suggestions are given for other exercises in order that the children may have more opportunities to use a wide variety of such verbs. (J.M.)

498. BLACK, J. W., What experimental phonetics has to offer the teacher of the deaf. *Volta Rev.*, 62, 1960, 313-315.

Under an assumption that learning the use of language on the part of the deaf is dependent on a schedule of reinforcement in the learning process and a set of signs that can be reinforced, this paper emphasizes the importance of Experimental Phonetics in contributing the displays or sets of signs. A further contribution to the teacher of the deaf, insight into the processes of voice communication, is assigned a secondary role. Three sets of signs that can be made the target of reinforcement of a deaf child's verbal responses are discussed. Available physical displays include representations of vocal intensity and acoustic spectrum, not ones that suitably follow either fundamental frequency or rate of speech. Another aspect of experimental phonetics that invites techniques of reinforcement includes intelligibility testing. A third relates to the statistics of language. Letter prediction is cited as instance that can be brought into the classroom and used in a way to invite reinforcement in connection with the student's oral responses. The call for Experimental Phonetics to provide techniques daily for the classroom—essentially to program a 'laboratory for the deaf'—is new and inadequately met. (Author's summary)

499. CABRAL, G. P., La teoría de la percepción sincrética, aplicada a la enseñanza del lenguaje al sordo. (The theory of syncretic perception applied to the instruction of language to the deaf.) *Fono Audio-logica*, Buenos Aires, 6, 1960, 52-58.

The author recommends a whole-sen-

tence approach in the teaching of speech to the deaf. She compares this approach to whole-word and analytic methods, and gives arguments in support of her approach from speech, speech reading, and from general pedagogic points of view. (M.S.W.)

500. INGALL, B. I., The not so simple rules. *Teach. Deaf*, Birmingham, 58, 1960, 182-188.

Language 'formulas' to accompany each arithmetic process are taught to deaf children as they proceed through addition, subtraction, multiplication, and division to avoid the pitfall of juggling numbers unrelated to meaning. Examples of the step by step 'formulas' are presented. (M.S.K.)

501. MORKOVIN, B. V., Experiment in teaching deaf preschool children in the Soviet Union *Volta Rev.*, 62, 1960, 260-268.

Soviet educators and psychologists in recent years have been focusing theoretical and practical research on the problem of providing deaf preschool children with sufficient language. The article first states that the oral program in the Soviet Union limits kindergarten children's speaking vocabulary to words which are easily pronounceable. Teaching pronunciation is an end in itself and is conducted apart from the rest of the kindergarten program. It is not incorporated in the child's daily activities. Therefore, in 1953-54, N. G. Morozova and B. D. Korsunskaja under the auspices of the Moscow Institute of Defectology introduced a different approach in teaching the oral method. The experiments added to the oral method of teaching language to deaf children, the printed form and finger spelling. The experimenters' goals were three-fold: (1) to enlarge the deaf child's communicative vocabulary when most needed; (2) to accelerate development of conversational speech and lip reading; and (3) to make language teaching grow from the direct sensory experiences derived from the child's activities. A brief outline of the first year of teaching the three to four year olds, the second year of teaching the four to five year olds, and the third year of teaching the five to six year olds is given. Finger spelling of new words and more difficult words is continued. However, in the third year finger spelling is dropped as soon as the word is

mastered in speech and lip reading. The experimenters reported large growth in vocabulary. The author points out the Russian language is much more phonetic than is the English language and that the change to sensory experiences derived from the child's activities helped to develop a large vocabulary and accounts somewhat for the dramatic results reported. (J.M.)

502. NELSON, M., Electrocutaneous perception of speech sounds. *A.M.A. Arch. Otolaryngol.*, 69, 1959, 445-448.

By electrically stimulating the cutaneous sensory receptors it appears to be possible to aid the deaf in the understanding and production of speech. Speech sounds (vowels) are converted into electrical signals. These, after being compressed to equal magnitude, are presented to the test subject by means of (a) an electrode on the dorsal area of the left forearm; the frequency band is from 100 to 4000 cps; (b) two electrodes on the same area some distance apart; one electrode receives the frequency band between 100-800 cps and the other the band 800-4000 cps. Ten test subjects were used. After some training they appeared to be able to distinguish between pairs of contrasting vowels; with one electrode the scores were about 60-70 out of 90 and with the two electrodes about 80 out of 90. The conclusion is that most normal hearing subjects can differentiate controlled vowel sounds cutaneously. The two-electrode system is superior to the one-electrode system. There are differences in individual sensitivity to cutaneous perception. (*Excerpta Medica*, XI)

503. OWRID, H. L., Measuring spoken language in young deaf children. *Teach. Deaf*, Birmingham, 58, 1960, 24-34, 124-128.

Two means of measuring spoken language of 372 children with impaired hearing ranging from 18 months through 8 years were investigated from 1954 to 1958 in the Department of Education of the Deaf, Manchester University. The first means measures spoken language by schedules of stages of development in comprehension and use of speech, tabulated and scored by clinicians. The second means of measurement is by three standardized tests; toy vocabulary test consisting of 25 objects, comprehension test consisting of 70 spoken

directions, and a test of use of speech in which children describe 10 pictures orally. Division of groups by hearing loss was at 75 db the hard of hearing with 30 to 75 db loss, and the deaf with 75+ db. Results indicate that differences in scores in favor of groups with better hearing are clearly marked and statistically significant. Effect of age shows that mean scores of sub-groups increase with increasing age. A comparison of sex differences revealed no differences between boys and girls in 30-75 db category but a slight difference in favor of girls in 75+ db category although the effect of variations in hearing loss is sufficient to outweigh factors of sex and small age increment. There are differences in results of tests in favor of children attending day schools in both 30-75 db and 75+ db hearing loss group over those attending residential schools although they do not reach the level of statistical significance. Hard of hearing children in 30-75 db category attending primary school for hearing children have higher scores than the average of the group due to better hearing. Children in 30-75 db category in residential schools for deaf and partially deaf are few in number, making few high scores but children in residential schools do not differ significantly from the average. Among 70 children with home training before they entered school through parental guidance at the Department of the Deaf, Manchester University, three-fourths of whom are severely or profoundly deaf, considerable difference exists in scores on each test in favor of home trained children and the differences are statistically significant. (M.S.K.)

504. OYER, H. J., and DOWDNA, M., Structural analysis of word responses made by hard of hearing subjects on a discrimination test. *A.M.A. Arch. Otolaryngol.*, 70(3), 1959, 357-364.

Sound substitutions occur more frequently in the discrimination task than do omissions and insertions. Confusions within groups of consonants are very similar for both hearing-loss categories except for nasals and blends. It appears that somewhat less confusion occurs on blends by the non-conductive group whereas somewhat more confusion occurs on the nasals. The PB words containing two, three, four, and

five sounds showed no marked differences in intelligibility. Sound omissions and insertions in error responses occur most frequently in the final position of the word. Discrimination losses decrease when the task is presented a second time. Although vowel confusions occurred less frequently than did consonant confusions, a significantly greater proportion of confusions occurred among vowels than among consonants. There is a difference in the degree to which the subjects with conductive loss and those with nonconductive losses will persevere in their error responses. Those with conductive loss were more consistent at each age level in repeating their errors than those with non-conductive loss. (*Excerpta Medica*, XIX)

505. RAPH, J. B., Problems and issues in teaching speech. *Volta Rev.*, 62, 1960, 302-306.

This paper gives attention to possible negative correlates that could accompany early identification and treatment of a child with a speech defect: (1) a child's difficulty in establishing a sense of trust in the adults around him because of their many and varied concerns and expectations related to his speech impairment; (2) the child's vulnerability to viewing himself of little worth because others have appraised his speech as lacking in worth; (3) the interferences with the child's development of a sense of free choice and leeway to move out in all social modalities because his particular speech characteristics either restrict him by their very nature or because he is restricted by virtue of being taught what to say and how to say it rather than acquiring speech proficiency more spontaneously and meaningfully in the natural language learning setting; and (4) the ever-present hazard of the child's prolonging unrealistically and inappropriately his dependency needs. The author, secondly, develops the concept of unconscious motivation as a pertinent factor in a school-age child's learning and notes that it was not ordinarily taken into account in educational planning and practices. A summary of some current research being done by McClelland and associates is made, and some implications for teaching suggested. (*Author's summary*)

506. STOKOE, W. C., Jr., Sign language structure: an outline of the visual communication systems of the American deaf. *Studies in Linguistics: Occas. Pap.*, 8, Buffalo 14, N. Y., and Gallaudet College, 1960. 78 p.

After a brief history of the use of sign language as a medium for instruction of the deaf, a review of the pertinent bibliography, and a consideration of the number of persons using the language, the scope of its use, and some of its other social implications, the author proceeds to describe the language of signs by adapting the Trager-Smith methods of analysis. Direct interpersonal visual systems open to the profoundly deaf include speechreading and speech, fingerspelling, and sign language proper; but actual communication is a mixture of some or all of these. The nature of fingerspelling is shown to be analogous to graphemic codes, with hand configuration, orientation, and, exceptionally, motion as differentiae; but this system is tertiary; its symbols have a one-to-one relation to the graphemic symbols of normal orthography. Signs themselves are shown to be true morphemes, i.e., the smallest units to which lexical meaning attaches in languages. Viewed as the system level, the sign-morphemes are structures, the unit or isolate level of which are *cheremes*, analogous to segmental phonemes. There is no vowel-consonant distribution of cheremes, but they may be seen aspectually to be significant of place, configuration, and motion, and are called in this study respectively *tab*, *dez*, and *sig* cheremes. These structure points of the language are isolated by 'minimum pair' and other linguistic techniques and assigned distinctive symbols for notation. Between the chere, unit- and the morpheme, system-level the morpho-cheremic level is examined, the data showing that in recognized linguistic ways the cheremes undergo change as physical or visible entities when they enter into combination with each other to form the morphemes. Here as in other parts of the structure, differences of individual as well as dialectal nature are noted. Unanalyzed but indicated are features of the language corresponding to intonation patterns. Facial expression and more general, as it were, kinesic phenomena appear to have some-

what the same syntactical and semological function as pitch, stress, and juncture. Some of the phenomena of compounding and contractions of signs are examined, but analysis of syntax proper is only sketchily indicated; the author and his associates Dorothy Sueoka and Carl G. Croneberg are beginning a two year investigation of the syntax and dialects of the language under a National Science Foundation Grant. In addition to a selective bibliography the work has as appendices a glossary of terms and a table of symbols. This last summarizes the chemic analysis, in other words, in approximately fifty unequivocal symbols the structure points of the language are so represented that it becomes entirely feasible for a user of the language to write down 'signs' and stretches of sign language utterance in a way analogous to phonemic recording of speech. (W. C. Stokoe, Gallaudet College)

507. WILLIAMS, H. G., *Signs of the times*. Teach. Deaf, Birmingham, 58, 1960, 327-328.

A brief description of three books on the language of signs used by the deaf of European countries is presented. *The Language of the Silent World* published by the British Deaf and Dumb Association in 1960 covers 570 words used by the deaf of England. *A First Book for the Individual Training of Adult Deaf Mutes* by I. A. Sokolyansky is a primer of 300 words with illustrations covering hand gestures for Russian finger-spelling and gestures representing sounds which can be simultaneously lipread. The book was published by the Moscow Ministry of Education in 1956. *The Dactylogic and Gestural Speech of the Deaf and Dumb* by I. Geil'man is a dictionary of 2000 signs published in Moscow in 1957. (M.S.K.)

508. WOODWARD, M. F., and BARBER, C. G., *Phoneme perception in lipreading*. J. speech hearing Res., 3, 1960, 212-222.

A research program has been set up to apply the theory and method of structural linguistics to an analysis of lipreading processes. As the first step, perceptual differences among English initial consonants were tested. Stimulus materials consisted of pairs of phonemically identical and

minimally different nonsense syllables, which provided a constant, nonredundant linguistic environment for the phonemes tested. Stimuli were presented to 185 experimental subjects, normal-hearing adult speakers of English, by means of a silent film. The test was administered also to smaller control groups by presenting the sound track alone, and by showing the complete film with both picture and sound. In place of the 24 initial consonants tested, results indicate that only four visually-contrastive units are available consistently to the lipreader. Though control group scores were not perfect, they were in accord with present knowledge about perceptual confusions among speech sounds in nonredundant environments and under less-than-optimum conditions of reception. (Authors' summary)

MULTIPLE HANDICAPS

509. DOCTOR, P. V., *Multiple handicaps*. Proceedings Conv. Amer. Inst. Deaf, 1959, 34-36.

The author points out initially that deafness itself is a multiple handicap involving problems in speech, education, social development, emotional adjustment, and employment. When these are compounded by brain injury, cerebral palsy, mental retardation, aphasia, or crippling, the educational problem is much greater. Though these children have always been with us, statistics indicate they are increasing in incidence and now according to the *Amer. Annals Deaf* represent 11 percent of pupils in schools and classes for the deaf. The need for research in this area was pointed out, but particular emphasis was given to the need to develop methods of teaching multiply handicapped children. (M.C.V.)

510. LEENHOUTS, M. A., *The mentally retarded deaf child*. Proceedings Conv. Amer. Inst. Deaf, 1959, 55-64.

The problem of the mentally retarded deaf child in California and in its residential schools is discussed. Statistics indicate there are 310 such children, which is 15 percent of the deaf school age population of the state. The Berkeley School's evaluation of these subjects involves extensive psychological and educational testing and observation. Following this the eligibility committee dis-

cusses the data and makes a decision about the child's mentality and eligibility. Some mentally retarded children are admitted, others are referred to state hospitals which have programs for trainable deaf children. The tremendous problems of adjustment presented by retarded deaf youngsters in a residential school are carefully discussed. The danger that the residential school's role may become that of a custodial dumping ground for deviant children is elaborated and given as one reason why such schools should be judicious in their admission policies. The state hospital program for trainable deaf children is outlined and the success it has had is pointed out. The fact that 20 percent of the pupils who went through Sonoma Hospital classes are now gainfully employed is given as evidence of this success. The need for a separate facility for mentally retarded deaf children is pointed out. It should be on the campus of a proposed new residential school, but should be a separate unit. This is felt to be a better solution to the problem than existing arrangements. (M.C.V.)

511. SHERE, M. O., The cerebral palsied child with a hearing loss. *Volta Rev.*, 1960, 62, 438-441.

The author discusses and discredits the following stereotyped conceptions of the cerebral palsied child: (1) emotional instability is inherent in the child with cerebral palsy; (2) there is a 'C.P.' personality; (3) these children cannot be expected to conform to the behavior standards held for normal children; (4) cerebral palsied children 'will outgrow it.' The author cites studies, the results of which refute these old clichés, as well as discussing the cerebral palsied child with a hearing loss. (J.M.)

PSYCHO-EDUCATIONAL FACTORS

512. BARTLETT, F., The teacher as investigator. *Teach. Deaf*, Birmingham, 58, 1960, 300-303.

Teachers of the deaf should develop an interest in investigating problems of sensory deprivation to make them more understanding as teachers and to add to the body of knowledge concerning deafness. Two questions open to investigation are: (1) Would deaf children especially trained in activities and skills which are adversely

affected by over-exposure to great noise be free from these drawbacks? (2) If excess noise has certain nonauditory effects would exclusion of sound have nonauditory effects also? These and similar questions pertaining to sensory deprivation are being studied by Professor D. O. Hebb at the University of Montreal. Well-designed and controlled classroom studies by trained teachers of the deaf should be encouraged. (M.S.K.)

513. BRILL, R. G., A study in adjustment of 3 groups of deaf children. *Except. Child.*, 26(9), 1960, 464-466, 470.

Subjects of this study were divided into groups composed of children with deaf parents, children with deaf siblings but hearing parents, and deaf children from families with no history of rubella or deaf relatives. There were no statistically significant differences in the ratings of the three groups taken as a whole. However, groups of children with deaf parents and with deaf siblings had more ratings at both extremes than the group of children who were the single deaf person in the family. The adjustment of children with deaf parents was observed to be no better than that of deaf children with hearing parents whether they had deaf siblings or not. It is implied that this may be so because of lack of adjustment on the part of an unusual number of these deaf parents. (*Rehab. Lit.*)

514. CAWTHORNE, T., The influence of deafness on the creative instinct. *Laryngoscope*, 70, 1960, 1110-1118.

The Spanish painter, Goya, became totally deaf suddenly at 47. Soon after, his paintings became somber in color and subject matter. The biting satire and venom of much of Jonathan Swift's writings may possibly be attributed to his annoyance and physical discomfort brought on by frequent attacks of bilateral Ménière's disease. Beethoven's music does not greatly reflect his personal bitterness and his unhappiness with his deafness probably because 1) his hearing loss was progressive rather than sudden, and 2) he probably had otosclerosis and did not suffer the distortion in sound which usually accompanies a serious sensory-neural impairment. (R.G.)

515. DOEHRING, D. G., Color-form attitudes of deaf children. *J. speech hearing Res.*, 3, 1960, 242-248.

A test of color-form attitude was administered to 95 deaf children and 90 hearing children ranging in age from 8 to 12 years, and also to 32 hearing nursery-school children and 33 hearing adults. The results indicated that the deaf children, as compared with their hearing peers, showed a greater tendency to differentiate visual stimuli on the basis of differences in color. Within the deaf group and within each of the hearing groups, males tended to make more color responses than did females. There was no change in the distribution of color-form attitudes between the nursery-school group and the adult group. The tendency toward color responding in deaf children was discussed with reference to the sex difference and the lack of change in color-form attitudes as a function of age. (*Author's summary*)

516. FRENCH, J. L., Intellectual appraisal of physically handicapped children. *J. genet. Psychol.*, 94, 1959, 131-141.

The current status of appraising the intelligence of physically handicapped children is presented. Currently used tests, and their modifications, are discussed. A review of research indicates a need for a new power scale for this purpose. The initial standardization of the North Central Individual Test of Mental Ability is outlined. (*Author's summary*)

517. HARRIS, D. B., A note on some ability correlates of the Raven Progressive Matrices (1947) in the kindergarten. *J. educ. Psychol.*, 50, 1959, 228-229.

The Raven Progressive Matrices (1947), the SRA Primary Abilities Test, and the Goodenough Draw-a-Man Test were administered individually to 98 kindergarten children, 45 boys and 53 girls, who were selected to represent the urban population of the United States by parental occupation. Age distribution for the sample is not given, other than the range of 5-1 to 6-1; however, the author states that, 'Reference to test norms shows that this group is very close to typical performance for its age (5-6) on all measures.' The total scores for the Draw-a-Man and Progressive Matrices, together with the Verbal Meaning, Perceptual

Speed, Quantitative, Motor, and Space scores from the PMA were intercorrelated by sexes and with sexes combined. Only the latter are reported in tabular form since the author found no marked or consistent sex differences. Intercorrelations between scores on the Progressive Matrices, and the Draw-a-Man and Progressive Matrices scores were statistically significant but rather low (.22-.36). Correlations between and within the Draw-a-Man and the PMA are substantially higher than the correlation of the Raven with either of them. The author indicates some need for a revision of the directions for administration of the Progressive Matrices. (*Child Development Abst. Bibl.*)

518. LESHIN, G., Childhood non-organic hearing loss. *J. speech hear. Dis.*, 25, 1960, 290-292.

The author describes the results of the 1958-59 hearing screening program administered by the Oregon State Board of Health to 123,428 children in kindergarten through ninth grades. Approximately two percent of the children found to have hearing loss were diagnosed as nonorganic. In most of these cases the hearing was found to be essentially normal. The author states that the nonorganic losses appeared to be at least partially based on unconscious motivations rather than on a deliberate preconceived plan of action. For these cases the otologist, medical-sound consultant, audiologist and local health department staffs worked together to (1) reconcile medical, audiological, and psychosocial data to arrive at the true hearing level, (2) attempt to determine familial and environmental factors contributing to the nonorganic loss, and (3) outline and implement a program for the removal or relief of the child's need to use nonorganic hearing loss as a personality mechanism. The need for further research on the incidence, causal factors, and medical and educational follow-up is reiterated. (*S.I.G.*)

519. LOVE, P. E., Child guidance. *Teach. Deaf, Birmingham*, 58, 1960, 227-234.

Child guidance is described as 'those services whose primary function is to help individual children who have actual or potential emotional handicaps.' These services are administered by Local Educa-

tion Authorities, Regional Hospital Boards and Boards of Governors, Local Health Authorities, and voluntary groups. Two components of child guidance are child guidance clinics and school psychological services. A child guidance clinic is primarily concerned with diagnosis and treatment of emotional disturbances in childhood. It is staffed by child psychiatrists, psychologists, social workers, and psychiatric social workers. A school psychological service is concerned with the application of psychology and psychological techniques to education. It is staffed by educational psychologists and occasionally social workers. Three main classifications of types of emotional disturbances met in these clinics are behavior difficulties, habit disorders, and nervous disorders. The 'depth approach is one method of dealing with these children. In this form of treatment an attempt is made to uncover the basic causes of child disturbance and to treat them rather than the presenting symptoms.' An alternate approach is through a series of interviews with mothers in an attempt 'to relieve emotional tension within the family group.' (M.S.K.)

520. MYKLEBUST, H. R., The psychological effects of deafness. *Amer. Ann. Deaf*, 105, 1960, 372-385.

Many psychological studies have indicated that sensory deprivation induced by alterations in sensory function cause changes in the psychological organization of individuals. When a distance sense such as hearing or vision is effected, psychological organization develops primarily in terms of the distance sense still intact or less disturbed. With reference to the intellectual development of the deaf from the standpoint of memory ability recent research has shown that they exceed the hearing on such tasks as Memory for Designs, which ability appears entirely dependent upon vision, but are inferior on such tasks as Digit Span, which appear associated with auditory experience. Research by the author and his associates regarding the abstract-concrete ability of the deaf with severe, early deafness indicates that deaf children are equal to the hearing on the more concrete types of intelligence tests but are inferior when the task requires abstracting a principle. The effects of deafness upon personality are more serious depending upon the age at

which the insult was suffered. Contrary to popular belief, the earlier the deafness the more deleterious is the effect upon personality development. Recent research with the deaf using the MMPI appear to indicate that the deaf feel detached and isolated as compared to the hearing. Comparisons between the deaf and hearing in language behavior revealed that the former were markedly inferior in sentence length, syntax, and concrete-abstract thought. As a result of his research the author has made several recommendations relative to the education of the deaf. (C.P.G.)

SOCIAL AND LEGAL FACTORS

521. ELSER, R. P., The social position of hearing handicapped children in the regular grades. *Except. Child.* 25, 1959, 305-309.

Sociometric tests were administered to 1258 students in the third through the seventh grades. Among these were 45 hearing handicapped children (loss in excess of 35 db, best binaural average of the frequencies 500, 1000 and 2000 cps). Although the results indicated that the handicapped as a group were not as well accepted and did not score as high as the average for their classmates, there was still a very wide range of acceptance of them as individuals. (*Child Developmt Abst. Bibl.*)

522. FRENCH, S. L., Doll play: a sociometric device for young deaf children. *Volta Rev.*, 62, 1960, 331-334.

The purpose of this study was to explore the possibilities of using projective doll-play techniques as a sociometric device with young deaf children. Dolls representing the individual members of a preschool class were used as an instrument through which the children could express their feelings toward each other. The doll play sessions were highly structured, and required the children to make rank order choices of like and dislike between their classmates. From these choices sociograms became possible. Two test situations were held for each child. The resultant rank orders of like were correlated to check the reliability of emotions expressed (average correlation .73). To test the validity of the sociograms, the rank orders were compared with ratings made prior to the experiment

(average correlation .78). Descriptive and qualitative discussions, as well as quantitative analyses, are included in the paper. The author concludes that the doll-play projective technique is well suited to the languageless deaf child. The emotions expressed in the structured situations were both reliable and valid. Useful sociometric information can be derived therefrom. (*Author's summary*)

523. GASKILL, P., Social psychology and the deaf child. *Teach. Deaf*, Birmingham, 58, 1960, 237-238.

Recognition of the need to deal more directly with emotional adjustment of deaf children is emphasized. Efforts to integrate deaf adolescents with normal hearing youths are not entirely successful. At present there is no scientific evidence to support the theory that the separation of mother and child in nursery school training will cause emotional trauma. Psychological testing using the Porteus Maze and the Lowenfeld Mosaics are attempts to evaluate emotional disturbances. A criticism of teacher's answers to questionnaires is that 'deafness when combined with educational subnormality, tends to take prominence over and divert attention from emotional disturbances.' (*M.S.K.*)

524. HEYS, A. E., The social side of residential school life. *Teach. Deaf*, Birmingham, 58, 1960, 274-277.

The social side of residential life may be viewed in three ways: (1) social behavior based on an accepted code of morals; (2) social activities of the children, spontaneous and planned; and (3) the unique opportunity of the residential school to encourage both social behavior and social activities. A good moral atmosphere is based on truthfulness, honesty, kindness, unselfishness and later on appreciation of cooperation, freedom, and tolerance. 'Clubs' sponsored by staff members cover a variety of indoor and outdoor activities. Scouts and Guides and visiting teams help to overcome potential insularity of residential life. Problems of adolescent adjustment are dealt with empirically on a common sense basis. Social activities provide for the following basic needs: (1) the need for security; (2) the need for new experiences; (3) the need

for recognition, success, and prestige; and (4) the need for responsibility. (*M.S.K.*)

525. KODMAN, F., Jr., SPIES, C., STOCKDELL, K., and SEDLACEK, G., Socioeconomic status and observer identification of hearing loss in school children. *Except. Child.*, 26, 1959, 176-179, 188.

Parent, teacher, and audiometric identification of hearing loss were compared using 716 elementary school children in grades two through six. Two socioeconomic populations were sampled. Parents and teachers were significantly inferior in identifying children with mild-to-severe hearing losses and those with normal hearing. Socioeconomic status was not found to be a significant variable. (*Child Developmt. Abst. Bibl.*)

526. LANE, H. S., Extracurricular activities of deaf children. *Volta Rev.*, 62, 1960, 169, 172-173.

The author states that the success and happiness of a deaf child in a hearing world are related to his ability to participate in extracurricular activities and his application of these abilities later in sports, hobbies, and social activities as an adult. She feels that the preparation of the deaf child to participate is a joint responsibility of the school and the parents. If the child is a residential pupil then more of this responsibility is on the school. The classroom teacher should assist the parents in teaching the language of games and activities that the child finds on the outside. Opportunities must also be provided to develop such skills and hobbies as woodworking, arts, physical education, homemaking, etc. These children cannot be integrated into hobby classes without the language of the hobby or skill. Dr. Lane lists a number of important skills that will help the child adjust socially. She emphasizes the child's need of learning language to express himself so that he can adjust on the adult level. (*J.M.*)

VOCATIONAL TRAINING AND ADJUSTMENT

527. ENGELBRECHT, G. K., Die dowe in die beroepslewe in Suid-Afrika. (The deaf in occupational life in South Africa.) *Rehabilit. S. Afr.*, 3(2), 1959, 69-78.

A short review after a survey of the expansion of occupations during 1953-1955

for 589 adult deaf in the Union of South Africa, as compared with the findings in England and America. Conclusions are that the deaf prefer to be employed in the towns; that occupational life in the Union of South Africa and South West Africa are about the same as in countries overseas. The investigation shows that deafness is a great handicap in the choice of occupation, but there is still a wide field where deafness does not stand in the way, in fact in very noisy occupations, like the manufacture of kettles, in forges (smithy) and steelworks, the deaf occupy a better position. Rehabilitation with the object of placing the deaf in suitable occupations is of the greatest value. (*Excerpta Medica*, XIX)

528. ENGELBRECHT, G. K., Die dowe in die beroepslewe in Suid-Afrika (Vervolg). (The professional and trade life of the deaf in South Africa [continued].) *Rehabilit. S. Afr.*, 3(3); 1959, 150-155.

Investigations in the trades and professions which deaf men and women carry on in the Union of South Africa and South West Africa showed that the largest percentage of deaf men work in the furniture, shoe and building trades, while deaf women on the other hand mostly work in clothing factories. Photographs of men and women at work are portrayed in the article. (*Excerpta Medica*, XIX)

529. GALLAUDET COLLEGE, Research facilities for the deaf in the United States, prepared by the staff of the American Annals of the Deaf . . . for the participants in the Workshop on Identification of Researchable Vocational Rehabilitation Problems of the Deaf. *Amer. Ann. Deaf*, 105(3), 1960, 271-311.

This entire issue was prepared for the use of participants at the workshop being held at the College June 19-22, 1960. The paper 'Psychiatric-preventive and sociogenetic study of the adjustive capacities, optimum work potentials and total family problems of literate deaf adolescents and adults,' by Edna S. Levine, is followed by a series of statements describing research facilities at the Central Institute for the Deaf, Northwestern University, John Tracy Clinic, the library of the Alexander Graham Bell Association for the Deaf, the Clarke School for the Deaf and its library, and Gallaudet Col-

lege and its library, and the National Index on Deafness, Speech, and Hearing. (*Rehab. Lit.*)

530. GALLAUDET COLLEGE, Workshop on identification of researchable vocational rehabilitation problems of the deaf. Sponsored by the Office of Vocational Rehabilitation, U. S. Department of Health, Education, and Welfare. *Amer. Ann. Deaf*, 105, 1960, 335-370.

The purpose of the conference was first, to identify research needs and their relative importance as to priority pertaining to the vocational rehabilitation of the deaf and, second, to acquaint research workers in other disciplines with these needs. The major recommendations included the need for measuring instruments, for demographic data on deaf populations, for longitudinal studies of concept formation and learning of the deaf, for evaluation of the various types of communication used by and with the deaf, for adult education programs, for evaluating vocational counseling, guidance, and placement needs and for programmatic research. (C.P.G.)

531. WHITE, O. L., The deaf in industry with an emphasis on placement. *Teach. Deaf*, Birmingham, 58, 1960, 279-282.

In the ordinary life of three score years and ten, the deaf person spends five years of uneducated childhood, 11 years at school, 49 years for a livelihood, and the remaining five years in retirement. Although some deaf youths remain in vocational school until nineteen before placement in a job, the school-leaver of sixteen often adjusts better to learning on the job. One of the difficulties in placement is to convince employers that the deaf man is capable of giving a good day's work in return for a fair wage. Welfare officers who remain in one area over a period of years develop valuable contacts for job placement. Future areas of emphasis to assist in job placement of the deaf are: (1) at 15-16 years of age, when the deaf go out into industry, some kind of leaver's club at school; (2) girls trained to high-speed typing (copy-typing); (3) knowledge of money values to the extent of budgeting a wage packet; (4) letters from schools asking how the deaf boy or girl is doing—teachers attending functions of the deaf and meeting deaf

former pupils; (5) a wider basic religious knowledge; and (6) a stronger link between teachers and welfare workers. (M.S.K.)

SPEECH

ACOUSTICS

532. MOSER, H. M., DREHER, J. J., O'NEILL, J. J., and OYER, H. J., Comparison of mouth, ear, and contact microphones. *Ohio State Univ. Res. Foundation*, TR 37, Jan. 1958 (AFCRC TN 56-58) ASTIA Doc. AD-98820.

A first-order differential noise-cancelling microphone (RCA M-33/AIC), used as a control microphone, and selected ear, throat, and bone transducers were compared under various noise conditions. Recordings made by trained talkers pronouncing Harvard PB words in quiet and in noise were presented to trained listeners in quiet and in noise. When recorded in quiet and played back in either quiet or noise the M-33 microphone excelled or equalled that of the ear transducer. When recorded in low levels of noise the ear transducer was superior or equal to the M-33. However, the M-33 was superior when the talkers were in 115-db noise. (J.C.W.)

533. TARNÓCZY, T., Sobre la investigación objetiva del espectro individual de la palabra. (Upon the objective investigation of the individual speech spectrum.) *Acta O.R.L. Iber-Amer.*, 11, 1960, 145-152.

As a means of objectively investigating the nature of the listener's subjective evaluation of another's speech, the author superimposes nine readings of nine different texts upon a single tape. A fifteen second sample of the resulting mixture is recorded by a frequency analyser. These transcriptions are also evaluated subjectively for virility, femininity, fullness, correctness of speech, speed, melody, nasality, etc. The author feels that this is the beginning of a fruitful approach to the problem. (M.S.W.)

ANATOMY AND PHYSIOLOGY

534. BERGER, M., FERGUSON, C., and HENDRY, J., Paralysis of the left diaphragm, left vocal cord, and aneurysm of the ductus arteriosus in a seven-week-old infant. *J. Pediatrics*, 56, 1960, 800-802.

The case of a seven-week-old infant who

had paralysis of the left vocal cord, left diaphragm, and at autopsy had aneurysm of the ductus arteriosus is presented. A description is given of a duosyndrome of the laryngeal nerve due to intrauterine malposition where the infant holds the head away from the midline with one side of the face weak or paralyzed from pressure by the uterine wall, the contralateral vocal cord is paralyzed producing dyspnea, inspiratory tug, and stridor, and there is difficulty in swallowing and regurgitation. Since there was no evidence of birth injury or intrauterine malposition, and since there was no facial paralysis or malposition of the head in the case presented, it is suggested that the cause of the paralysis of the left vocal cord and left diaphragm was the aneurysm. (N.J.C.)

535. BRUNETTI, F., Les trois motricités laryngées. Altérations simples ou associées d'origine centrale de ces trois motricités. Travaux expérimentaux de Bolsi et Fasano. (The three motivities of the larynx. Simple or associated alterations of central origin of these motivities. Bolsi's and Fasano's experiments.) *Rev. Laryngol. Otol. Rhinol.*, Bordeaux, 80(9-10), 1959, 627-641.

After having recalled the three different neuromuscular functions which respectively permit the adduction, abduction and vibration of the vocal cords, the author dwells upon the accurate anatomicophysiological description of the three motive courses during their flow from the CNS to the fibers of the recurrent nerve. Particular attention is given to the complex problems in connection with the alterations of the larynx motivity and of the voice in relation with the different levels of the experimental lesions and surgical neurons and in the different types of peripheral paralyses. The data obtained permit important deductions concerning the mechanism of the neurophysiological regulation of the vocal functions. (*Excerpta Medica*, XI)

536. DRAPER, M. H., LADEFOGED, P., and WHITTERIDGE, D., Expiratory pressures and air flow during speech. *Brit. Med. J.*, (5189), 1960, 1837-1843.

Using a body plethysmograph (for changes in chest volume), a balloon in the oesophagus (for tracheal pressure), electromyography (for muscular activity), meas-

urements were made during the normal utterance of repeated monosyllables as well as connected speech. Tracheal pressure remained constant for speech of constant loudness, the range being from two cm of water for quiet speech to 30 cm for loud (40 db louder) shouting. To achieve this constant tracheal pressure, at first inspiratory muscles (especially external intercostals) opposed the relaxation (lung recoil) pressure, then expiration increasingly utilized internal intercostals, and, later, accessory expiratory muscles. Internal intercostals were active consistently in speech, with bursts of action potentials before stressed syllables, confirming Stetson's views on the role of expiratory muscles to produce pressure changes in speech. Thus, 50 msec. before speech occurred, the internal intercostals became active, 20-40 msec. later oesophageal (tracheal) pressure started to increase. (J.C.S.)

537. EVOY, M. H., Observations with certain experiments on the paralyzed vocal cords in dogs. *Laryngoscope*, 70, 1960, 1268-1271.

Experiments with the transplantation of a voluntary muscle to the paralyzed arytenoid cartilage in dogs have been carried out. It appears that in the laboratory animal, scar tissue fixation of the transplanted muscle, and an invariable fibrous union between the arytenoid cartilage and the ala of the thyroid cartilage, prevent the desired action of the transposed sternothyroid muscle. (Author's conclusion)

538. FINK, B. R., and KIRSCHNER, F., Observations on the acoustical and mechanical properties of the vocal folds. *Folia phoniat.*, Basel, 11(4), 1959, 167-172.

The geometrical configuration of the larynx during phonation was studied by X-ray tomograms. The internal surfaces are shaped like a nozzle providing optimum flow conditions during respiration. The exponentially curved surfaces constitute a horn, functioning as an acoustic transformer between the infralaryngeal and supralaryngeal cavities during phonation. (*Excerpta Medica*, XI)

539. HOSHIKO, M. S., Sequence of action of breathing muscles during speech. *J. speech hearing Res.*, 3, 1960, 291-297.

Electromyographic investigation of the sequence of action during phonation from three respiratory muscles indicated the onset pattern as follows: internal intercostals, rectus abdominis, and external intercostals. The pattern of action potential activity indicated that muscles have an onset sequence pattern which is maintained in spite of changes in speech material and rates of utterance. Lack of action potential activity from the external intercostal muscles at the termination of the phonation suggested that this arresting action may depend upon other muscle activity. (Author's summary)

540. HUSSON, R., Le fonctionnement du larynx comparativement dans la parole et dans le chant. (The comparative functioning of the larynx in speech and singing.) *Acta Linguistica*, 10, 1960, 19-54.

The article describes the functioning of the larynx in some detail, devoting particular attention to the differences observed between phonation in speech and singing. The article is an exposition of the 'neurochronaxic' theory of voice production. According to this theory, the human larynx functions somewhat like a siren. The vocal folds do not vibrate. The glottis opens and closes in a rapid sequence, each glottal opening being the result of a purely neuromuscular action, triggered by an impulse from the recurrent nerve. These successive salvos are launched by cerebral centers. The so-called vibration of the vocal folds is thus of purely cerebral origin. Various research studies by the author and his colleagues are quoted in support of the theory, and previous criticisms are answered by references to contrary evidence. For example, one of the criticisms had been that the difference in length between the right and the left recurrent nerve would prevent the vocal folds from vibrating in phase, if the vibrations are due to active muscular contractions as a result of direct innervation. The author quotes recent findings of J. Krmpotic (Zagreb), according to which the difference in length of the two nerves is compensated for by the difference in diameter of their axons, so that the impulses arrive at the two vocal folds simultaneously. The article contains 28 illustrations and a bibliography of 88 items, 64 of which are by the author. (I.L.)

541. KRMPOTIC, P. J., L'index neuromusculaire des nerfs relatifs a la phonation. (The neuromuscular index of the nerves related to phonation.) *Rev. Laryngol. Otol. Rhinol.*, Bordeaux, 81(3-4), 1960, 232-243.

The relation between the length of a nerve and the diameter of its fibers gives us an index for the moment of arrival of the nerve impulses in the end organs and we suggested hence the name neuromuscular index for it. We measured the length and the diameter of the fibers of all cranial nerves taking part in phonation. The vagus and phrenicus were measured on both sides, because of the great difference in length between the left and the right nerve. This difference in length was compensated by the difference in diameter of the nerve fibers in the recurrent as well as in the phrenic nerve. When we divided the length of the left respectively of the right recurrent laryngeal nerve each with the middle value of their fibers, we got the same number, which means that in spite of the different length of both nerves and of the difference in the velocity of conduction the nerve impulses reached the end organ at the same time, i.e., the neuromuscular index was identical. We could prove the same relation for the right and left phrenic nerve. Comparing the neuromuscular indices of the nerves related to phonation, we were able to establish the sequence in the arrival of nerve impulses in the end organs. Before the impulses reach the vocal muscles all other auxiliary muscles are tonified. The digastric muscle pulls by its contraction the hyoid and thus the larynx backwards, the sternocleidohyoid fixes the head and the neck, the cricothyroid fixes the main laryngeal cartilages, the supra and infrahyoid muscles fix the hyoid and thus the larynx. Later on are tonified the muscles of the face. The index of the phrenic nerve is bigger than the indices of all other nerves related to phonation with exception of the fibers for the vocal muscle which proves that the phrenic nerve assures a certain subglottic pressure before the vocal cords start vibrating. This fact is supporting Husson's theory. (*Author's summary*)

542. MANSON-HING, L. R., Use of dental x-rays in roentgenography of the

palatopharyngeal mechanism. *Oral Surg.*, et al., 13, 1960, 1085-1088.

A technique is described in which a dental x-ray machine is used to take lateral skull roentgenograms to study the relations of the palate and adjacent pharynx. Exposures are made while the patient is at rest and during the prolonged phonation of the 's' sound. (*A.K.K.*)

543. MITROVIC, P. M., and MILOJEVIC, B., Le radiodiagnostic du voile du palais. (Radiography of the soft palate.) *Rev. Laryngol. Otol. Rhinol.*, Bordeaux, 81(3-4), 1960, 260-270.

(1) Radiography of the pharynx represents an objective method for the investigation of the physiology and pathology of the soft palate, pharynx, and the tongue. It discloses insufficiencies of the soft palate and possible compensatory mechanisms. (2) Radiography discloses the importance of Passavant's ridge in various pathological cases. (3) Radiography of pharynx, in most cases, enables us to choose the right method of treatment—conservative, operative, or combined. (4) In post operative stages radiography helps us in defining the plan of therapy. (5) In phonetical and pathophonetical studies radiography of pharynx is a precious aid. (*Authors' summary*)

544. MOLL, K. L., Cinefluorographic techniques in speech research. *J. speech hearing Res.*, 3, 1960, 227-241.

This study was designed to investigate the methodological problems involved in using cinefluorography for studies of the physiological characteristics of speech articulation. The results of experimentation with X-ray generator settings, X-ray filtration, film stock, and film processing were presented. It was concluded that pictures which provide adequate definition for measurements of structures can be obtained with tolerable radiation dosages. A frame-by-frame tracing-measuring procedure by which cinefluorographic information can be quantified was described. Reliability analyses indicated that the analyzing procedures provide data of adequate reliability for most research purposes. The results of a pilot study of two adult subjects with normal speech point up the limitations of single-exposure radiography in studies of speech physiology and suggest possible areas for

future cinefluorographic research. Various limitations of cinefluorography were considered. It was concluded that this technique is a valuable research procedure for studies of the physiology of speech articulation. (*Author's summary*)

545. PALUDETTI, G., and DI GIROLAMO, A., *Considerazioni istomorfologiche sulla struttura della corda vocale falsa*. (Histomorphological notes on the structure of the false vocal cords.) *Il Valsalva*, Rome, 36(4), 1960, 198-208.

The authors report on a study they conducted to investigate the structure of the false vocal cords. They constantly observed the presence of a strongly marked glandular component as well as of muscular fibers variably disposed and organized. In fact such fibers, which are sometimes very scanty and dissociated and sometimes arranged accordingly as a spincler disposition, may exceptionally appear so conspicuous by number and bulk that they form a true muscular body covered with its connective sheath. In the body of each cord the muscular part occupies a constant and well-defined place. In the study of the false vocal cords the observations referred to above, concerning both muscular and glandular components, allow to appreciate the significance of such structures in the genesis of some laryngopathies, with particular reference to chronic catarrhal laryngitis, most of which are despondently tenacious, and to that particular form of functional dysphonia well-known under the denomination of 'false vocal cord voice.' (*Authors' summary*)

546. SHELTON, R. L., Jr., BOSMA, J. F., and SHEETS, B. V., Tongue, hyoid, and larynx displacement in swallow and phonation. *J. Appl. Physiol.*, 15, 1960, 283-288.

Cinefluorographic observations of the pharyngeal portion of the tongue and of the hyoid and larynx of 10 persons were reported during the following physiological acts: deglutition while in upright and in supine positions, phonation of the sound (m), and phonation of the sound (m) in the falsetto voice. The patterns of displacement in deglutition were found to be consistent among and within subjects for the 10 subjects. Consistent patterns were not

found in the phonation series, but various similarities of phonation and deglutition were noted. The conclusions were reached that performance of swallow may be used to evaluate motor performance in the pharyngeal region and that understanding of pharyngeal physiology requires a multi-structural approach. The concept of a unified tongue-hyoid-larynx column was endorsed. (*Authors' précis*)

547. SONESSON, B., A method for studying the vibratory movements of the vocal cords. A preliminary report. *J. Laryngol.*, 73(11), 1959, 732-737.

In a preliminary report the author describes a method for recording the vibratory movement of the vocal cords. This method has not been used previously in the study of living individuals. The subglottic space is illuminated by means of a laryngodiaphanoscope lamp and the light passing through the glottis is intercepted by a plexiglas rod introduced through the mouth. The rod conducts the light to a multiplier phototube, whereupon the recording takes place by means of an oscilloscope. As a result of vibratory movements of the vocal cords the flow of light through the glottis changes and a sinusoidal trace is recorded. The apparatus is called glottograph and the traces obtained are called glottograms. The work of standardizing the method and of collecting and processing more extensive material is in progress. (*Excerpta Medica*, XI)

548. WU SHAO-CH'ING, LI HUATEH, and SA T'ENG-SAN, Normal value of residual air and its clinical significance. *Chin. med. J.*, 77, 1958, 442-451.

In residual air determinations on 50 healthy individuals it was found that, although the residual air and other lung volumes are slightly higher in the male than in the female, the residual air/total lung capacity x 100 is essentially the same in both sexes. The difference in lung volumes between the two sexes is obviously due to the greater body surface area of the male than the female. Age is an important factor in influencing residual air, because, while the body surface area in age groups between 17-30 and 31-60 is essentially the same, the residual air/total lung capacity x 100 shows a significant difference. From

the material presented, the normal value of residual air/total lung capacity $\times 100$ may be regarded as 28% for persons below 30 yr. of age, and 35% for persons above 30. (*Excerpta Medica*, XX)

549. YAMASHITA, T., and URABE, K., Über den Stimmband-tensorreflex. (The tensor reflex of the vocal cord.) *Z. Laryng. Rhinol. Otol.*, Stuttgart, 38(11), 1959, 759-766.

The tensor (cricothyroid) reflex of the vocal cord was elicited by galvanic stimulation of the internal laryngeal nerve or of the mucosa of the posterior laryngeal wall (mucosal stimulation). Ten decerebrate and lightly anaesthetized dogs were used. The following results were observed: (1) Every galvanic suprathreshold stimulus to the mucosa of the posterior laryngeal wall produces bilateral tensor reflexes of the vocal cords. These represent a part of the glottic closure reflex. (2) Experiments with the internal laryngeal nerve show that a direct reflex pathway from the sensory int. ramus to the motor ext. ramus cannot exist nor an indirect one via the gl. nodosum, i.e. pseudoreflex pathways (axon reflexes). The center for these reflexes may be in the bulbar nuclei of the vagus. (3) Using the same duration, a greater intensity of stimulus and a longer latent period are required to produce the reflex when stimulating the posterior laryngeal wall than when the internal laryngeal ramus is stimulated direct. (4) Repeated high intensity stimulation of the internal laryngeal nerve leads to summation of the excess excitation which causes one or several 'extra-contractions' of the cricothyroid muscle. This summation probably takes place in the reticular formation of the medulla. (*Excerpta Medica*, XI)

AUDITORY FEEDBACK

550. BLACK, J. W., The reading of messages of different types and numbers of syllables under conditions of delayed side-tone. *Ohio State Univ. Res. Foundation and USN School Aviat. Med.*, Report 78, August 1958.

Delayed side-tone retards speech. This effect has been suspected to relate to the syllable in speech, the duration of a syllable almost coinciding with the value of delay time that occasions maximum retardation. Eight sets of phrases were con-

structed for oral reading. Two sets were comprised of five syllables, in one instance consonant-vowel syllables and in the other, vowel-consonant. Three sets were made to include only syllables of two, three, or four sounds and a total of either 15 or 16 sounds. Three additional sets were the same as the preceding ones except that the total number of sounds was either 20 or 21. Each of twenty-four young male adults read a set of the phrases under 12 conditions of delayed side-tone ranging from zero delay to 0.30-second delay. The duration of the oral phrase was measured. The reading of phrases of vowel-consonant syllables was more adversely affected by delayed side-tone than was the reading of consonant-vowel syllables, and the disparity between the two increased as the amount of delay of side-tone was increased to 0.21 sec. Otherwise syllables and phrases of different lengths were responded to 'alike,' there being no interaction between the amount of delay of side-tone and the structure of the phrase. (*Author's précis*)

551. TOLHURST, G. C., Speaker intelligibility: A note on the effect of monaurally delaying airborne side-tone. *Ohio State Univ. Res. Foundation and USN School Aviat. Med.*, Report 84, January 1959.

Delayed monaural airborne side-tone was experienced by 48 speakers, one-half of whom had side-tone delayed to the right ear and the other one-half to the left ear. Each speaker experienced ten different time delays during his reading of multiple-choice intelligibility lists. Speaker scores were assigned each talker by panels of listeners. 12-15 per panel. . . . Monaural airborne delayed side-tone did not significantly affect speaker intelligibility scores except at 0.11, 0.17, and 0.18-second delay times experienced in the left ear and possibly 0.16 second in the right ear. (*J.C.W.*)

COMMUNICATION THEORY

552. CHESNI, P. Y., Quelques applications de la cybernétique a une théorie du langage. (Some applications of cybernetics to a theory of language.) *Rev. Laryngol. Otol. Rhinol.*, Bordeaux, 81(3-4), 1960, 255-259.

In brief, relying on introspective findings, for a long time already numerous writers had proposed the hypothesis that, during the

'interior' formulation of words, that is to say during verbal thought, the whole of the neuro-phonic circuit enters into activity in the same way that it does when spoken aloud, although in a less intense manner (and variable, anyway, according to the degree of the 'interiorisation of the verbal thought' of the subject). The matter was, in reality, to try to justify *a posteriori* this stand, how little dogmatic it may sound, by a few decisive arguments of an experimental nature. On our part, we have been able to make several new observations in regard to the comparison of speeds of interior formulation and of the spoken word in a certain number of nervous disorders, notably in parkinsonism; laryngologists have brought us various observations dealing with these studies; we have been able to observe recently, by indirect laryngoscopy, faint movements of the vocal cords during the interior formulation in normal subjects. If it were precisely revealed that the whole of the neuro-phonic circuit enters into activity during verbal thought, it would be difficult to avoid the idea that this one, like the spoken word, is submitted, as a signal, to the laws of reflexology and, as a feed-back, to those of the cybernetics; the proposed scheme (which has no anatomic significance) has no other pretense but to state the question. (*Author's summary*)

553. WANG, J., Some contributions of cybernetics to behavior study. *Acta Psychol. Taiwanica*, 1, 1958, 104-111.

Summarizes main ideas of Weiner, Ashby, Shannon, and Weaver and gives examples of feedback, condition of excitation, information theory, and equilibrium theory. Cybernetics may not solve all of the problems today, but it at least is a departure from the traditional barren approach. Cybernetics permits a clear recognition of the problems, offers workable interpretations and solutions, and has made a marked contribution toward solving problems formerly considered too complicated. (*Psychol. Abst.*)

INTELLIGIBILITY

554. BLACK, J. W., The relationship between the frequency spectrum of speech and scores yielded by multiple-choice intelligibility tests. *Ohio State Univ. Res. Found-*

ation and USN School of Aviat. Med., Report 81, August 1958.

Intelligibility scores were obtained from forty seven listeners on both PB words and multiple-choice words (from five talkers) heard at various signal levels and in various high- and low-pass bands. 'The range of audio frequencies up to 7000 cps was divided into 20 bands that contribute equally to the scores of the multiple choice intelligibility tests. The same system throughout was employed to make the same determinations relative to monosyllabic test materials.' The analytical procedures were those used in the determination of the articulation index. 'The results showed that the identification of a monosyllable auditorily (write-down intelligibility testing) and the selection of a word that has been heard from a group of similar words (multiple-choice intelligibility testing) are related to the band width of the signal in almost the same manner.' (*J.C.W.*)

555. CURRY, E. T., FAY, T. H., Jr., and HUTTON, C. L., Experimental study of the relative intelligibility of alphabet letters. *J. acoust. Soc. Amer.*, 32, 1960, 1151-1157.

This preliminary study was designed to ascertain the relative intelligibility of the twenty-six individual spoken alphabet letters when presented to normal listeners over a 45-db range of levels. The gain function for the pooled results of 26 letters spoken by three experienced speakers to 18 listeners has a sigmoidal shape. The 15-db increase in presentation level from 10 to 25 db yields a 65% increase in correct identification for all letters. The average slope of the pooled curve for all letters between 20 and 80% was 4.34% per db. The curves appear to be similar to those of the more difficult stimuli such as the monosyllabic PB lists and unselected disyllabic lists. Percentages of correct identifications for each letter at each presentation level are also presented. (*Authors' précis*)

556. KRYTER, K. D., Speech bandwidth compression through spectrum selection. *J. acoust. Soc. Amer.*, 32, 1960, 547-556.

Although there have been several studies of the effect on intelligibility of high-, low-, and single band-pass filters, this appears to

be the only study concerned with the effects of a series of narrow band-pass filters. Using 500 cps widths, the study reports effects on intelligibility and 'naturalness' of voice when combinations of one, two, and three filters are used at various center frequencies along the spectrum. Results of most intelligible filtering are discussed in terms of vowel formant regions and transitions. (B.A.L.)

557. MOSER, H. M., O'NEILL, J. J., and ADLER, S., A study of number-telling methods in communication. *Ohio State Univ. Res. Foundation*, TR 48, July 1958 (AFCRC TR 58-55) ASTIA Document No. AD 152647.

When Americans transmit to Americans, the following single-digit pronunciations are statistically superior: (0) *ze-ro*, (1) *uh-wun*, (3) *th-r-ee*, (6) *six*, *sixer*, *sub-six*, and (7) *sev-ven*. When foreign speakers transmit to Americans during adverse listening conditions the following single-digit pronunciations are statistically superior: (1) *ze-ro*, *zero*, (2) *too*, *tuh-too*, (4) *four*, (5) *fi-i-iv*, *five*, (6) *six*, *sixer*, (8) *ait*, *a-ait*. When transmitting two-, three-, or four-digit numbers, all speakers were more intelligible with the single-digit telling method. (J.C.W.)

558. MOSER, H. M., OYER, H. J., FOTHERINGHAM, W. C., O'NEILL, J. J., and WOLFE, S. M., The effect of auditory stimulation on the pronunciation of English words by non-native speakers. *Ohio State Univ. Res. Foundation*, TR 54 (AFCRC TN 59-56).

Fifty commonly used words in aviation communication were uttered by 8 foreign college students before and after 3 pronunciations of the word by a native American talker. Two experienced listeners rated the intelligibility of the pre- and post-pronunciations and 16 panels (from 16 to 30 listeners) wrote down the word they thought was pronounced. Both the rating scale method and the objective intelligibility score methods showed the superiority of the post-stimulation speech. Vowel distortions and the subsequent improvement in vowel pronunciation accounted for the difference. (J.C.W.)

559. TOLHURST, G. C., Listener reception: The effects of: Part I—Diotic and

dichotic peak clipping, Part II—Reintroducing selective filtering at various interruption rates, Part III—Specified amounts of peak clipping. *Ohio State Univ. Res. Foundation and USN School of Aviat. Med.*, Report 82, January 1959.

PART I. Dichotic listening with one channel peak clipped and the contralateral channel undistorted yields higher reception scores than either diotic (same signal to both ears) peak clipped or diotic clear listening conditions. PART II. A clear recording of multiple-choice tests was high- and low-pass filtered and then interrupted at six rates. The resultant signals were then re-recorded and reintroduced simultaneously upon a clear recording. The reinforced recording was played diotically to panels of listeners. Low-pass filtering yielded slight but generally higher reception scores than did interrupted high-pass filtering. PART III. Peak clipping of clear signals in quiet results in progressive message degradation with increased clipping whereas in noise a general improvement is found. (J.C.W.)

560. TOLHURST, G. C., The effects of signal-to-noise ratios and peak clipping upon a time accelerated multiple-choice intelligibility test. *Ohio State Res. Foundation and USN School Aviat. Med.*, Report 83, January 1959.

Multiple-choice intelligibility tests were recorded with less and less time between successive items as the test progressed. This accelerated item test was a more difficult listening task than the regularly spaced test. It made no difference whether one talker was used for all words or a different talker for each of the three words when listening in the quiet. The accelerated item test did not differentiate among three favorable S/N ratios. As the level of peak clipping increased, listener response scores decreased. (J.C.W.)

PHONETICS

561. ANDRESEN, B. S., On the perception of unreleased voiceless plosives in English. *Lang. and Speech*, 3, 1960, 109-119.

The paper describes an experiment dealing with the possibility of distinguishing auditorily between unreleased [?] and un-

released [p], [t], and [k] in English. The test words were [lɒp], [lɒt], [lɒk], [lɒʔ], and [lip], [lit], [lik], and [liʔ]. These words were recorded on tape and presented to 31 hearers for identification. The listening tapes consisted of several randomized series of words, involving choices between all four possibilities on the one hand, and binary choices between [ʔ] and each one of the stops on the other hand. One group of listeners heard the stimuli over headphones, the other group through a loudspeaker. It was found that correct identification depended very much on the quality of the preceding vowel sound, especially in the case of [p], [k], and [ʔ]. Under the best listening conditions, [ʔ] was identified with considerable accuracy: after one hearing, the identifications were correct 89.9% of the time, when there were two alternatives, and 74% of the time, when there were four alternatives. Under less favorable conditions (i.e. when the stimuli were presented over a loudspeaker in an ordinary room), the identification was scarcely better than pure chance. The responses given by the group of listeners who heard the stimuli over headphones were 88.9% correct, but the responses given by the loudspeaker group were only 60.6% correct. Less favorable listening conditions had the most damaging effect on sounds that had the lowest percentage of correct response under favorable conditions. For example, the identification of [lip] signals was 99% to 97% correct under the two listening conditions; however, the identification of [liʔ] signals was 85% and 44%, and that of [lɒʔ] signals 65% and 16% correct when presented over headphones and over a loudspeaker, respectively. (I.L.)

562. BLACK, J. W., A relationship among fundamental frequency, vocal sound pressure, and rate of speaking. *Ohio State Univ. Res. Foundation and USN School Aviat. Med.*, Report 77, August 1958.

Speaking rate and voice frequency are studied with vocal effort the controlled variable. Twenty males recorded three vowels and three phrases: (a) under the direction to read the material naturally, (b) the same, while wearing sound attenuation ear muffs, and (c) at each of four specified levels, ranging from soft to loud. Phrases that were read with different

amounts of sound pressure, soft to loud, differed in duration, being spoken more rapidly when said loudly. This observation, however, ignores the obviously practical fact that among the present two series of conditions the phrases were spoken more rapidly in the uncontrolled conditions than in any of the controlled ones. For both vowels and phrases increments in vocal effort were reflected in increments in fundamental frequency. (J.C.W.)

563. BOREL-MAISONNY, S., Contribution à l'étude de la perception des phonèmes. (Contribution to the study of the perception of phonemes.) *Psychol. Franc.*, 3, 1958, 209-224.

Problems concerned with the measurement and study of the phoneme as a unit of speech are discussed in four categories: the phoneme artificially isolated for purposes of analysis, the anatomical and physiological conditions of its production, the sensation which it produces for the speaker and hearer, its contribution to the understanding of what is spoken. (*Psychol. Abst.*)

564. BUYSENS, E., Development of speech in mankind. *Manual of phonetics*, 1957, 426-436.

There is no trouble in accounting for the emergence of inarticulate language such as is exemplified in the learning of responses which signal needs and influence others to do things. But the task of imagining how primitive man came to articulate his language is more difficult. Nevertheless, the author feels able to account for this by appeal to a number of 'primitive tendencies which are still at work in modern language,' e.g., with tendency to interpret linguistics materials with the wrong units. (*Psychol. Abst.*)

565. DESRETS, M. S., Determinacion de la rapidez promedial del habla y sus extremos. (Determination of the average speed of speech and its extremes.) *Fono Audiologica*, 6, 1960, 113, 114.

By means of a stop-watch and a tape recorder, the author determines the mean duration in seconds of words and of prose and poetic syllables in various samples of Argentine Spanish. For lectures she obtains 0.4041 sec. per word, 0.19095 sec. per prose syllable, and 0.20125 sec. per poetic syllable.

For declamation she obtains 0.3621 sec. per word, 0.2077 sec. per prose syllable, and 0.2306 sec. per poetic syllable. For conferences and discourse she obtains 0.72 sec. per word, 0.3756 sec. per syllable of prose, and 0.4156 sec. per syllable of poetry. For theatrical speech she obtains 0.1784 sec. per word, 0.0919 sec. per prose syllable, and 0.1006 sec. per poetic syllable. She gives the mean duration of the words from the cited selections as 0.4002 sec.; for prose syllables, 0.186 sec.; and for poetic syllables, 0.1974 sec. From the figures obtained, the author arrives at a mean duration of 0.199325 sec. for all poetic syllables, and believes it convenient to utilize this figure as unity. The extremes are illustrated by two cases: rapid speech is exemplified by means of 0.2129 sec. per word, 0.1073 sec. per prose syllable, and 0.1137 sec. per poetic syllable. The mean durations for the sample of slow speech were: 0.9627 sec. per word, 0.5111 sec. per prose syllable, and 0.5916 sec. per poetic syllable. The author does not include any interpretation of the results. (*M.S.W.*)

568. GEMELLI, A., and BLACK, J. W., *Phonetics from the viewpoint of psychology. Manual of phonetics*, 1957, 94-117.

A review of two lines of study of interest to the psychologist: the listener's recognition of the phonetic signal, and the feedback of the signal which apparently occurs in the speaker. The major part of the paper is concerned with intelligibility testing, including the reports of several original investigations. There is a brief discussion of the implications of research with delayed side tone. (*Psychol. Abst.*)

567. HAMP, E. P., *American English phonemes. J. acoust. Soc. Amer.*, 32, 1960, 1079-1080.

In order to be useful as a basis for frequency tables for American English phonemes, retranscriptions of existing word lists must take account of recent advances in phonemic structure, and must be based on freshly recorded utterances representing a significant number of important dialect varieties. Routine assignment of the traditional IPA symbols is inadequate. (*Author's précis*)

568. HOCKETT, C. F., *Animal 'languages' and human language. Hum. Biol.*, 31, 1959, 32-39.

Seven key design-features of human language are distinguished: duality of patterning, productivity, arbitrariness, interchangeability, specialization, displacement, cultural transmission. It is hypothesized that the protohominoids had a vocal-auditory communicative system possessing specialization, interchangeability, arbitrariness, and a small amount of cultural transmission, and that this system 'was the precursor of human language.' (*Psychol. Abst.*)

569. HOCKETT, C. F., *The origin of speech. Sci. Amer.*, 203, 88-96.

Theoretically, there are two formidable ways of studying the origin of speech. One, to discover an old tribe of men (quasi-men) who have never been in contact with civilized homosapiens; they could serve as 'living fossils' attesting to earlier stages of human evolution and language evolution. As this has not yet been accomplished (and may never be), the second approach, the comparative method of historical linguistics, is employed in this paper. A set of 13 design-features of animal communication are discussed in detail since all languages of the world share every one of them. These are: (1) vocal-auditory channel, (2) broadcast transmission and directional reception, (3) rapid fading, (4) interchangeability, (5) total feedback, (6) specialization, (7) semanticity, (8) arbitrariness, (9) discreteness, (10) displacement, (11) productivity, (12) traditional transmission, and (13) duality of patterning. Eight systems of communication are discussed in respect to how they contain, in varying degrees, the 13 design features of language. (*E.H.N.*)

570. IRWIN, R., *A problem of assimilation. Quart. J. Speech*, XLVI, 1960, 302-303.

The assimilation in English caused by the rapid utterance of the sound [j] when it is preceded by [t] is discussed as it pertains to assimilations considered acceptable and not acceptable. In many words such as 'nature' and 'suture,' the [j] sound following the [t] has been assimilated to [ʃ]. This assimilation has been accepted by almost everyone. The author points out that similar assimilations, though guided by

the same kinesiological rules, have not been accepted when they occur between words. For example, the articulatory sequence in 'state your name' is the same as in 'nature.' Several other examples are given. In the interest of 'purity of speech,' children have been drilled to avoid the assimilation of [j] after [t] between words. Since the sound sequence is difficult to say without assimilation, speakers unconsciously hit upon an assimilation involving the elimination of the [t] and the substitution of a glottal stop in its place. The author feels the 'glottal stop solution' is a vulgarism which should be avoided and which would be avoided if speakers were allowed to use the assimilation of [j] to [ʃ] after [t]. (H.L.L.)

571. KRAMSKY, J., A quantitative typology of languages. *Lang. Speech*, 2, 1959, 72-85.

Texts from 23 languages covering the main linguistic and geographic groupings of the world were examined for the relative frequency of occurrence of phonemes of different phonetic character. Languages were found to differ in their exploitation of vowels and consonants in their inventories. On the basis of a finer analysis of consonants, the author distinguishes three types of languages with respect to manner of articulation and four types according to place of articulation. (*Psychol. Abst.*)

572. LEHISTE, I., An acoustic phonetic study of internal open juncture. *Phonetica*, 5, Suppl., 1960, 49 pp.

The present work treats of the phonetic and phonemic character (phonological) of the so called 'internal open juncture' in standard American-English. The hypothesis of a causal connection between the limits of morphemes and 'internal open juncture' is considered but rejected. The research is accomplished by examination, by means of methods of experimental phonetics, of materials consisting of 304 individual words and phrases. Tape recordings of the materials, spoken twice by three subjects, are spectrographically analyzed. Twenty-five of the words and phrases assembled for minimum contrast, and spoken by three subjects, are judged by forty auditors. The phonetic character of the different types of 'internal open juncture' is described as

founded upon spectrographic analysis and upon the judgment of the listeners, and explained in eleven illustrations. The theory is proposed that the 'internal open juncture' represents the limit between two 'bounded sequences.' The 'bounded sequences' of phonological units of a range superior to that of the phoneme, although the limits of a word frequently coincide with the limits of a word in the lexico-graphic sense, are exclusively determined by phonology and are not in any relation to the units of the morphological and grammatical hierarchies of the language. (*Author's summary*)

573. LOTZ, J., ABRAMSON, A. S., GERSTMAN, L. J., INGEMANN, F., and NEMSER, W. J., The perception of English stops by speakers of English, Spanish, Hungarian, and Thai: a tape-cutting experiment. *Lang. and Speech*, 3, 1960, 71-77.

This paper compares the interpretation of a set of residual stop consonants (i.e. stops in [s] clusters after the removal of the [s]) by listeners who were native speakers of American English with the reactions of listeners who were native speakers of Puerto Rican Spanish, Hungarian, and Thai. A set of 18 monosyllabic words were prepared, chosen so that all single stops and stops in [s]-clusters occurred before one front and one back vowel. The words were recorded by three native speakers of American English. Then the initial friction in the words beginning with [s] was removed, and a randomized tape was made containing the remaining portions and the other words. Thirty-five native listeners identified the residual stops with the voiced (lenis) stop; 12 listeners with Spanish and five listeners with Hungarian backgrounds identified the residual stops with the voiceless stops; 12 listeners with Thai as native language identified the aspirated voiceless stops with the aspirated voiceless stops in the Thai system, the residual stops for the most part as voiceless unaspirated stops, and the voiced stops as voiced stops. The results indicate that there is a hierarchy among the cues in the acoustic stimulus for the perception of these sounds in various languages. For American English, it appears that the lack of aspiration is the dominant cue, forcing the evaluation of the residual stops as [b d

g]; for listeners with different language backgrounds, the evaluation is different and appears to depend on the phonemic distinctions present in the listener's native language. The data support the point of view that the linguistic categories of the listener's native language influence his interpretation of speech sounds. (*I.L.*)

574. LUCHSINGER, R., Phonetics and pathology. *Manual of phonetics*, 1957, 339-363.

Chiefly a description of instrumental recording techniques particularly useful in studying such pathological phenomena as defects of speech melody, dyslalia (including disorders of nasality), the speech of laryngectomized patients, sigmatism, cluttering, and stuttering. (*Psychol. Abst.*)

575. MALÉCOT, A., Nasal syllabics in American English. *J. speech hearing Res.*, 3, 1960, 268-274.

The literature on syllabic nasal consonants in American English is briefly summarized. Differences of opinion concerning their articulation, acoustic characteristics, and role in the phonemic structure of the language are discussed. Experimental data are given from tape-cutting experiments with real speech which suggest that certain commonly occurring nasal syllabics are identified as to their place of articulation by the preceding stop; that the closing transitions of the preceding consonant determine the perceived place of both; that a completely nonspeech steady-state segment can be successfully substituted for the syllabic. Finally, the suggestion is made that context is important as an identification cue. (*Author's summary*)

576. MEINSMA, G. L., and VAN GELDER, G., Onderzoek naar de taalkundige waarde van bepaalde toonhoogtepatronen. (Investigation of the linguistic value of certain pitch-patterns.) *Ned. Tijdschr. Psychol.*, 13, 1958, 490-508.

A phonetic study of the pitch pattern of words leads to the suggestion that the characterization of sentences takes place by melodic means. The special pitch patterns of question, assertion, and call are studied and analyzed. (*Psychol. Abst.*)

577. NEWMAN, E. B., Statistical methods in phonetics. *Manual of phonetics*, 1957, 118-126.

A brief discussion of certain statistical methods, mainly those dealing with discrete classes, applicable in phonetics. Sampling, chi square, and information measures are mentioned and illustrated. (*Psychol. Abst.*)

578. PETERSON, G. E., Articulation. *Manual of phonetics*, 1957, 156-165.

Three basic types of articulation are discussed in detail: plosive-pulse, vibratory-periodic, and fricative-random. Sound spectrographs are shown for various types of sounds and sound combinations. (*Psychol. Abst.*)

579. PETERSON, G. E., and LEHISTE, I., Duration of syllable nuclei in English. *J. acoust. Soc. Amer.*, 32, 1960, 693-703.

The duration characteristics of vowel nuclei were studied relative to influence by adjacent consonants. Results indicate that initial consonants have a negligible effect on vowel duration, but final consonants, in CVC combinations, have a marked effect. In general, the vowel is shorter when followed by a voiceless consonant than by a voiced consonant. Syllable nuclei are shortest when followed by plosives, and longest when followed by voiced fricatives. (*B.A.L.*)

SEMANTICS

580. TRIANDIS, H., Some determinants of interpersonal communication. *Hum. Rel.* 13, 1960, 279-287.

An experimental study was conducted in an attempt to specify the meaning of cognitive similarity and its importance in communication effectiveness. Previous research by the experimenter had shown that the similarity in attributes used to communicate was related to the effectiveness of the communication between two people. The present study sought answers to the following questions: (1) If two persons use the same dimensions (semantic) when communicating, must they agree with one another when assigning events to positions along these dimensions? and (2) How close must this agreement be in order to constitute cognitive similarity and to insure communi-

cation effectiveness? Cognitive similarity was measured by means of various indices utilizing data obtained from Osgood's semantic differential. Communication effectiveness was measured by the success of a person in matching the semantic differential of another person to the correct word. The data showed that the more similar the semantic profiles of a given concept, as judged by two people, the more likely it is that they will be able to communicate effectively about that concept. (H.L.L.)

581. TROJAN, F., General semantics: A comparison between linguistic and sublinguistic phonic expression. *Manual of phonetics*, 1957, 437-440.

'General semantics' is intended to be the term for the study of the essential features of linguistic systems through a comparison with extralingual semantic systems. This brief essay considers certain kinds of signs in a 'sublinguistic' system such as strength of voice, nasality, vibrato, etc., which are related to emotional processes. (*Psychol. Abst.*)

SPEECH AND LANGUAGE DEVELOPMENT

582. ARCHER, M., Building vocabulary with a fourth-grade class. *Elem. Eng.*, Nov. 1960, 447-448.

This is a narrative report of the way one fourth-grade class learned words to replace the over-use of 'said.' By allowing the children to think of other words that could be substituted for 'said,' interest was developed and a total of 104 substitute words were found. (H.L.L.)

583. BERKHOUSE, R. G., WOODS, I. A., and STERNBERG, J. J., Measurement and prediction of foreign language speaking ability. *USA TAGO Personnel Res. Br. tech. res. Rep.*, No. 1115, 1959, 19 p.

Speaking ability, as measured in an interpreter work situation, can be predicted with a fairly high degree of confidence by paper and pencil group tests of language ability and thus could serve as rough screening devices for the majority of jobs requiring foreign language speaking ability. Part 1, Understanding, of the ALPT was as valid as any of the other experimental tests tried out for this purpose. Individual testing procedures, such as those exem-

plified in the Army Foreign Language Speaking Test (AFLST), are needed only for those few assignments where high level speaking ability requirements predominate. (*Psychol. Abst.*)

584. BLACK, A. D., and GRINDER, R. E., Reliability of the Ammons FRPV test and the relationship between two measures of verbal comprehension for a Japanese-American sample. *Psychol. Rep.*, 5, 1959, 261-263.

Forty bilingual and 37 monolingual freshmen college students who were third generation Japanese were given Forms A and B of the Full-Range Picture Vocabulary Test (FRPV) and the Vocabulary, Effectiveness of Expression, and Total English subtests of the Cooperative English Tests. The two forms of the FRPV test, which are relatively independent of ability to express oneself in language, correlated .81. Correlations among all subtests ranged from .56 to .78 indicating that the two tests give comparable measures of verbal comprehension for this sample. Previous research suggests bilingualism may affect language development during childhood, but 'present data suggest such influence may have little effect by late adolescence.' (*Psychol. Abst.*)

585. BLACK, J. W., The reception of messages of different lengths. *Ohio State Univ. Res. Foundation and USN School of Aviat. Med.*, Report 79, August 1958.

Experience with a foreign language or foreign students reveals the relative success that individuals have with short sentences, and the failure that they experience with long ones. This study was to test the successes and failures that individuals have with sentences of various lengths. The deleterious effects of greater sentence length on comprehension (as indicated by the answers to factual questions) and on being aware of the signal (as indicated by writing the final words of the sentence) is the same as the deleterious effect of noise in the listening circuit. (J.C.W.)

586. BRUNET, O., Niveaux d'acquisition du langage et résultats à des épreuves non verbales d'intelligence. (Levels of acquisition of language and results from non-

verbal intelligence tests.) *Psychol. Franc.*, 3, 1958, 197-208.

A number of experiments with preschool children of different levels of language development and different socioeconomic levels are discussed. Subjects accelerated in language development did best in all of their age-level tests and were particularly superior on tests involving visual perceptual organization. Deaf-mutes had their greatest difficulty in the visual-perceptual organization tests. (*Psychol. Abst.*)

587. CAMPBELL, R. N., The oral approach with large classes. *Language Learning*, 10 (1,2), 1960, 41-46.

A plan is described for use of the 'oral approach' (C. C. Fries, *Teaching English as a Foreign Language*) in large classes (35-40 or more) of foreign students. (*F.R.*)

588. GARDNER, R. C., and LAMBERT, W. E., Motivational variables in second-language acquisition. *Canad. J. Psychol.*, Toronto, 13, 1959, 266-272.

Montreal high school students studying French as a second language completed a battery of tests including measures of linguistic aptitude, verbal intelligence, and various attitudinal and motivational characteristics. Analysis of the intercorrelations of these tests yielded two orthogonal factors equally related to ratings of achievement in French: a 'linguistic aptitude' and a 'motivational' factor. It was also found that maximum prediction of success in second-language acquisition was obtained from tests of: verbal intelligence, intensity of motivation to learn the other language, students' purposes in studying that language, and one index of linguistic aptitude. (*Authors' summary*)

589. HAGGERTY, A. D., The effects of long-term hospitalization or institutionalization upon the language development of children. *J. genet. Psychol.*, 94, 1959, 205-209.

Over a period of five years data were gathered on 100 seventh grade children who had spent an average of 3.5 years in some type of hospital or institution. Measures were oral speech samples, the vocabulary subtest of the WISC, and the Rorschach. The data are interpreted to indicate that their formal speech organization and overall personality characteristics resemble

those of schizophrenics. (*Child Developmt. Abst. Bibl.*)

590. JOHNSON, G. O., CAPOBIANCO, R., and MILLER, D., Speech and language development of mentally deficient children enrolled in training programs. *Excep. Child.*, 1960, 72-77.

Thirty-two mentally deficient children attending public schools and 80 severely retarded children residing in institutions were given an articulation test in early 1955 with retests in late 1955 and 1956. Eleven sounds were tested in the initial, medial and final positions of a word represented by a picture. Results showed (1) a trend toward fewer errors as IQ increases, (2) institution and public school groups made similar progress, although the public school group was slightly superior, (3) omission was the most common error, (4) final position was most frequently in error. A second part of the study was concerned with language development with and without special training. The non-therapy (control) group and the therapy (experimental) group each consisted of 11 public school and 13 institution children who were carefully matched. Results showed that the initial and final mean language ages of both the therapy and non-therapy groups were more than a year below their mean mental ages and that there were no significant statistical differences between the therapy and non-therapy groups. (*E.H.N.*)

591. SAMPSON, O. C., The speech and language development of five-year-old children. *Brit. J. educ. Psychol.*, 29, 1959, 217-222.

The aim of this research was to continue the study of speech development reported in 1956 of children 18 to 30 months of age. The same 50 children (25 boys and 25 girls), representative of all elements in the community, were followed up at the age of five years. They were given intelligence, vocabulary and language tests. Most were seen in school. Every child had made progress and this progress appears to be related to his family's occupational status and his own general intelligence. When the earlier and present ratings were compared, the correlation was positive but somewhat low. There was some evidence in the performance of the five-year-old children

tending to indicate the boys' superiority in precision and the girls' in fluency of expression, but on the whole the sex differences were small. (*Author's summary*)

592. SIEVERS, D. J., and ROSENBERG, C. M., The differential language facility test and electroencephalograms of brain-injured mentally retarded children. *Amer. J. ment. Def.*, 65, 1960, 46-50.

EEG tracings were taken from brain-injured mentally retarded children. Subjects whose EEG's could be categorized (1) grand mal pure, (2) grand mal and petit mal mixed, (3) hypothalamic and (4) slowing, were used in the study. There was a total of 50 subjects. Scores of the four groups of subjects on the Differential Language Facility Test were compared. Significant differences existed between groups on Grammatical Mimicry and Vocal Cloze Grammar, two subtests related to the audio-vocal process of transmitting language. These two subtests assessed the ability (1) to hear fragmentary parts of words and integrate them into their whole, (2) to reproduce a series of meaningless sounds as an integrative sequence, (3) to integrate speech into intentional sequences automatically, (4) to perceive grammatical incongruencies in patterns of verbal stimuli, (5) to hear a fragment of any sentence and supply necessary verbal symbols making a whole, and (6) to produce sequences with no additional external stimuli except initial set. Results suggested that children in the 'grand mal mixed with petit mal' grouping might have more difficulty in the audio-vocal area of language on grammatical and integrational levels. The 'grand mal mixed with petit mal' group was significantly lower than the 'slowing' group on both Grammatical Mimicry and Vocal Cloze Grammar. The 'hypothalamic' group was significantly lower than the 'slowing' group on Grammatical Mimicry. On Vocal Cloze Grammar the 'grand mal mixed with petit mal' group had a significantly poorer performance than the 'hypothalamic' group. The 'grand mal pure' group had a significantly poorer performance on Vocal Cloze Grammar than did the 'slowing' group. A concluding inference is that brain-injured mentally retarded children are not heterogeneous with regards to audio-vocal forms of language behavior. (*N.J.C.*)

593. SOKHIN, F. A., On the formation of linguistic generalizations in course of speech development. *Vop. Psikh.*, 5, 1959, 112-123.

Experiments with two- to three-year-old children have revealed that a child goes through several stages in the process of forming grammatical generalizations. At the first stage the grammatical element (in the case dealt with—a preposition indicating a space relation) is not perceived by the child as a significant element of the phrase, which contained an instruction for the child to act according to it. At this stage the understanding of the phrase depends essentially on the situation. At the second stage the grammatical element presents itself to the child as an independent significant link of the phrase structure, designating a definite space relation. However, nonlinguistic factors continue to play an important role in the process of understanding. It is only at the third stage that the understanding depends entirely on the phrase structure, on the meaning of the preposition. The formation of a linguistic generalization proceeds essentially by abstraction, i.e., by detachment from the given situation. The data obtained show that this law holds as good for active speech as for the understanding of spoken sentences. (*Child Development Abst. Bibli.*)

VOICE

594. GEDDA, L., FIORI-RATTI, L., and BRUNO, G., La voix chez les jumeaux monozygotiques (The speaking voice of single-cell twins). *Folia Phoniat.*, Basel, 12, 1960, 81-94.

An experimental study of the speaking voice of twenty pairs of single-cell twins and four pairs of two-cell twins is reported. The elements considered are otorhinolaryngeal examination, speaking voice examination, spectroacoustical speech analysis, and fundamental laryngeal tone analysis. The technique of acoustical analysis is to photograph the oscillographic presentation of the phonetic elements. The frequency range from 100 cps to 8000 cps is considered. Considerable similarity is noted in the speaking voices of single-cell twins prior to puberty. The similarity in structure and function of the larynx is suggested as an area for genetic research. (*J.B.R.*)

595. RUBIN, H. J., and HIRT, C. C., The falsetto. A high speed cinematographic study. *Laryngoscope*, 70, 1960, 1305-1324.

The falsetto refers to the upper part of the singing range situated above the point at which there occurs a change from relatively full and sonorous tones to those of characteristically lighter and thinner quality. The various mechanisms by which this is accomplished are complex but essentially of such a nature that the thyroarytenoid muscles are refrained from vibrating in their entirety as they do in the fundamental register. Three basic patterns of vibratory activity in the falsetto have been identified by high-speed photography. The first is the open-chink, in which the cordal margins do not or only occasionally touch each other in vibration; the second is the closed-chink, in which they do make contact; and the third is damping, in which pitch is raised by progressive approximation of corresponding segments of the vocal cords usually from posterior to anterior. The first two mechanisms are by far the most common and are accomplished with the vocal cords vibrating in their entire length just as in fundamental registration. The distinguishing feature of the falsetto is decreased activity of the laterally situated mass of thyroarytenoid musculature. In damping there is also an actual shortening of the vibrating elements of the cords. The degree of vocal training is of prime importance in determining both the acoustical qualities of the falsetto and its appearance in high-speed photography. In making transition from the fundamental register to the falsetto in incompletely trained voices, high-speed photography reveals a period of muscular dyscoordination, the length and degree of which is directly related to the vocalist's skill. In the advanced vocalist this so-called 'break' is not heard nor is it seen in film sequences, selective contraction and relaxation of the thyroarytenoid muscles effecting a smooth transition from the lower register to the falsetto. This selective control continues throughout the falsetto so that the entire vocal range may appear to be an extension of one basic mechanism. Variations in vocal skill are associated with such wide differences in acoustical properties of the voice and physiologic behavior of the vocal cords, that it

is impossible at this time to encompass vocal registration in a single descriptive terminology. (*Authors' summary*)

596. TROJAN, V. F., *Die Stimme des Hypnotiseurs* (The voice of the hypnotist). *Folia Phoniat.*, Basel, 12, 1960, 137-144.

Selected recordings of professionally oriented hypnotists are analyzed using semantic and psychoacoustic techniques. It is reported that hypnotic suggestion employs monotonous speech, speech intended to evoke visual images and motor function, or emotive vocal expressions. Appropriate use is made of vocal restraint and vocal force, and of an open or constricted pharynx. (*J.B.R.*)

SPEECH DISORDERS

APHASIA

597. AHRENS, R., *Zum problem der impressiven Sprachstörungen*. (On the problem of perceptual disturbances of speech.) *Nervenarzt*, 29, 1958, 488-493.

In total sensory aphasia optic and tactile perceptions are impaired in addition to acoustic ones. More precisely, there is inability to perceive stimuli presented as sequence in time (e.g., Morse code), while coordination of stimuli in space is preserved. As optic and tactile stimuli usually appear in some spatial arrangements, this accounts for the predominantly acoustic manifestations of impairment in sensory aphasia. It is further plausible that impaired perception of temporal succession of stimuli does not entail associative disturbances as in amnesic aphasia. (*Psychol. Abst.*)

598. BARGER, W. C., Late reading in children: A review of its origins with discussion of a correcting device for the aphasic type. *Cerebral Palsy Bull.*, 7, 1959, 20-26.

Late reading may have several origins; the area of aphasia should not be overlooked in the diagnostic evaluation. A technique is described in which the pupil starts by learning to read well in a mirror. It is employed when strephosymbolia (twisting of the symbols) and mixed lateral dominance are present. The technique produces the best results when there are no collateral aphasic handicaps with the reading dis-

ability, particularly conceptual aphasic elements.' (*Child Developmt Abst. Bibl.*)

599. CRITCHLEY, M., *Jacksonian ideas and the future, with special reference to aphasia. Brit. med. J.*, 5191, 1960, 6-12.

In his Centennial Oration of the Institute of Neurology given at County Hall, London, in June, 1960, the author discussed the ideas and clinical methods of Hughlings Jackson and their influence on the discipline of neurology. Biographical material shows how Jackson's interest turned to the field of neurology and the area of disordered speech. New tools for research in aphasiology are discussed by the author, as are eight problems requiring research before questions can be answered. These problems, he believes, are of the sort that would have intrigued Jackson and his ideas are sure to stimulate investigations seeking solutions. (*Rehab. Lit.*)

600. DOEHRING, D. G., and REITAN, R. M., *MMPI performance of aphasic and nonaphasic brain-damaged patients. J. clin. Psychol.*, 16(3), 1960, 307-309.

Findings of the study led to the conclusion that both aphasic and nonaphasic brain-damaged patients manifest personality disturbances similar to those of nonbrain-damaged patients with neurotic symptoms. The study does not attempt to explain why brain-damaged patients, who are generally considered to be rather apathetic, should be more highly motivated to make socially acceptable responses than are nonbrain-damaged patients with pronounced neurotic symptomatology. Results support Wepman's contention that aphasic patients tend to manifest personality disturbances in addition to language disturbance directly associated with aphasic symptoms. It is suggested that such disturbances are characteristic of brain-damaged patients in general, irrespective of the presence or absence of aphasic symptoms. (*Rehab. Lit.*)

601. DRAPER, I. T., *Aphasia: a problem of clinical assessment. Surgo, Glasgow*, 25(1), 1958, 30-34.

This history of the development of theories concerning the etiology of aphasia is presented, particularly in reference to localization of brain lesions according to

loss of specific language function. Recent developments in neurosurgery, as well as numerous head injuries during World War II, have made possible detailed studies of the relationships between language losses and brain lesions. The inference is drawn that control of language functioning is central in the association fibers of the cortex in the dominant hemisphere, and that specific disturbances of language functioning cannot be correlated with lesions in specific areas of the brain. (*Excerpta Medica, XIX*)

602. GODFREY, C. M., and DOUGLASS, E., *The recovery process in aphasia. Canad. med. Assn J.*, Toronto, 80(8), 1959, 618-624.

Of 38 patients with dysphasia due to a cerebrovascular accident and with ages ranging between 33 and 83 years, the majority received speech group treatment early after the onset of their illness. The duration of the treatment which was carried out by non-trained therapists, was 12 months. The inexperience of the therapist is an advantage because it promotes spontaneous contact. In 37%, the speech disturbances and the psychosocial behavior improved, in 42% there was only a psychosocial improvement. Expressive aphasia has the best prognosis. The value of this therapy is considered critically: it is possible that the improvements noted were entirely spontaneous and not the result of the treatment. The sporadic references in the literature to the results of speech therapy in aphasia are not comparable to one another owing to the differences in the mean age of the patients, the cause of the aphasia and the time of institution, nature and duration of the treatment. Objective criteria for the degree of aphatic disturbances, comparative studies, control groups and experiments in respect to environmental influences are lacking, but they are necessary to evaluate a speech therapy. The effect of the 'goal-directed' speech therapy which is generally applied is doubtful, certainly if it is not combined with psychotherapy and kinesitherapy, both of which are also necessary. (*Excerpta Medica, XIX*)

603. GOODGLASS, H., and BERKO, J., *Agrammatism and inflectional morphole-*

gy in English. *J. speech hearing Res.*, 3, 1960, 257-267.

This study was concerned with the morphological, as distinct from the syntactical, aspects of grammatical disturbance in aphasia. Specifically, it investigated the ability of 21 aphasic subjects to supply, by means of a sentence completion test, correct inflectional endings for nouns, verbs, and adjectives. The results suggest the following tentative conclusions: (a) For aphasics, the difficulty of various inflectional endings follows a definite order which is based on grammatical function, not phonological similarity. (b) Phonological complexity is not as important for aphasics as for children in determining the difficulty of inflections. (c) A common factor appears to underlie adequate performance with all inflectional endings studied except the simple past. (d) The inflectional ending score is related to verbal agility in articulation, but is not related to over-all adequacy of speech. It is suggested that, in some aphasics, the syntactic and inflectional aspects of grammar may be impaired independently of each other. (*Authors' summary*)

604. LAMBERT, W. E., and FILLENBAUM, S., A pilot study of aphasia among bilinguals. *Canad. J. Psychol.*, 13, 1959, 28-34.

Fourteen patients in Montreal were studied and compared to a group of European polyglot aphasics described by Leischner. For the Montreal group, the language learned first and used most was the first to be recovered, in contrast to the European group. A distinction between compound and coordinate bilingualism is useful for interpretation. (*Psychol. Abst.*)

605. LANDAU, W. M., GOLDSTEIN, R., and KLEFFNER, F. R., Congenital aphasia. *Neurology*, 10, 1960, 915-921.

The authors define congenital aphasia as a relatively isolated defect in the development of expressive and/or receptive aspects of oral language. The lack of language is not primarily due to auditory insensitivity, emotional disturbances, or mental retardation. A case history of a child diagnosed as being aphasic and having cyanotic heart disease is presented. The white male was born in 1945 after eight and

one-half months of uneventful pregnancy. The boy was noted to be cyanotic at the age of 10 days when a cardiac murmur was noted. At age six he was examined at Johns Hopkins Hospital Cardiac Clinic and the following was noted. The boy was poorly nourished and poorly developed with a marked right scoliosis. He had no speech but seemed bright. He was cyanotic and polycythemic. Following this examination the boy was seen at Central Institute for Deaf. The initial examination revealed that the boy responded to sounds but did not comprehend speech. His attempts to communicate consisted of facial expressions and gestures that varied in pitch, inflection, and volume with the meaning he seemed to be trying to convey. He occasionally included appropriate single words. He was able to imitate single words but they were without meaning to him. He could not imitate phrases or sentences. The boy was enrolled in a class for aphasia and was able to develop speech. The June, 1955, progress summary indicated successful use and comprehension of tenses, regular and irregular verbs, time phrases, participles, etc., with rapidly expanding vocabulary. The use of language was best in structured lessons but spontaneous speech was effective if less accurate. He comprehended oral language best when spoken slowly with pause after each word. Audiometric examinations were administered at regular intervals, the last examination being January, 1954. The pure tone test was inconsistent with each test. Speech audiometry by monitored live voice elicited most reliable responses and indicated hearing levels within normal range. December, 1955, age 10, the child became ill with mumps and died suddenly, presumably because of cardiac complications. Autopsy revealed bilateral old infarctions in the sylvian regions and severe retrograde degeneration in the geniculate nuclei. (*B.S.S.*)

606. MYKELBUST, H. R., and BOSHES, B., Psychoneurological learning disorders in children. *Arch. Pediat.*, 77, 1960, 247-256.

Scientifically, the factors that impair learning are those which have a psychological causation, those caused by impairment of the peripheral nervous system, and those due to disorders of the central nerv-

ous system. More recently other factors which impede learning have come into the foreground. These involve the neurology of learning and can be referred to as psychoneurological learning disorders. Five cases of congenital origin are discussed. These involve expressive aphasia, receptive aphasia, dyslexia (inability to read), dyscalculia (calculating problem), and orientation and time disorder. There is a need for research on psychoneurological problems at all age levels. The approach of the writers is as follows: (a) Children presenting problems in learning are studied behaviorally to determine that intelligence is normal, that sensory capacities are intact, and to define the type of learning disorders present. (b) The child receives neurological and electroencephalographic study. Total time devoted to the examination of each child is from eight to ten hours. All findings, neurologic, electro-encephalographic and behavioral are coded and treated statistically through the use of an IBM electronic computer. Generalizations that can be made at this time are as follows: (1) The number of public school children having psychoneurological learning disorders might exceed five per cent. (2) Incidence of these disorders is at least five times more common in males than in females. (3) A preponderance of children with problems of revisualization have disturbances in the occipital-parietal area. (4) A significant number of children with problems of reauditorization have disturbances in the temporal-parietal area. (5) Certain psychometric procedures indicate the presence of learning disorders and the area of the brain which is involved. (6) Educational-language therapy can be planned according to the specific type of psychoneurological problem existing. (M.N.)

607. Van THAL, J. H., Polyglot aphasics. *Folia Phoniat.*, Basel, 12, 1960, 123-128.

Fifteen case histories of multi-lingual aphasics are presented. With the exception of two persons the adopted language was reacquired prior to the native language. The majority of the persons reported did not recover all of the languages previously known. Factors other than neurological are suggested as the basis for recovery. These factors include length of residence in the adopted country, manner of learning, and

purpose or reason for coming to the adopted country. (J.B.R.)

ARTICULATION DISORDERS

608. MORLEY, M. E., Defects of articulation. *Speech Pathol. Ther.*, London, 2(2), 1959, 56-63.

The classification of disorders of articulation presented is an over-simplification of the problem, as defects frequently arise from a combination of more than one basic disorder. This may depend upon the extent of the cerebral lesion, or, for example, defective articulation may result from the combination of a cleft palate and a hearing loss, or articulatory apraxia. However, the author has found the conditions described consistent with clinical experience and useful as a practical basis for diagnosis and prognosis. In articulatory apraxia there is normal receptive ability for articulation and a normal motor mechanism, but there is some degree of failure of the normal receptor processes to guide and control adequately the otherwise normal motor mechanism for articulation. (*Excerpta Medica*, XI)

CEREBRAL PALSY

609. DUNN, L. M., and HARLEY, R. K., Comparability of Peabody, Ammons, Van Alstyne, and Columbia test scores with cerebral palsied children. *Except. Child.*, 26, 1959, 70-74.

The Peabody, Ammons Full-Range, and Van Alstyne Picture Vocabulary Tests, and the Columbia Mental Maturity Scale were administered within two weeks to 20 children with various types and degrees of cerebral palsy. The mean CA was 11-0. Teachers ranked the subjects on reading and arithmetic achievement. The Peabody was found to have the most and the Columbia the least bottom of the four tests. The alternate form reliability coefficient was .97 for the Peabody, and .86 for the Ammons. Inter-correlations among MA scores on all four tests exceeded .80. Inter-correlations of teacher rankings of reading and arithmetic achievement and MA scores were .80 and above. It was concluded that all four tests can be used successfully with cerebral palsied children in predicting school success, and that the Van Alstyne should be used only for children of MA

below 8-0, and the Columbia for children above 4.0. (*Child Development Abst. Bibl.*)

610. IRWIN, O. C., Substitutions and omissions of initial double consonant blends in the speech of children with cerebral palsy. *Cerebral Palsy Rev.*, 20(2), 1959, 10-12.

The Templin initial double consonant blend test was administered to 102 children with cerebral palsy, aged 3 to 16-years, in speech and hearing centers. The mean score for articulating correctly the initial double consonant blends was 16.3, for the substitution errors it was 2.09, and for the omission errors, 4.41. These differences were significant. The 10 most frequent initial consonant blends for which other sounds were substituted are pl, thr, shr, gl, cl, tw, fr, bl, cr and pr. The 10 most frequent blends omitted are sp, st, sk, sn, sm, fl, sw, tw, and cr. (*Child Development Abst. Bibl.*)

611. IRWIN, O. C., A sixth short consonant test for use with children with cerebral palsy. *Cerebral Palsy Rev.*, 20(2), 1959, 13-16.

Templin's test of final double consonant blends was administered to 160 children with cerebral palsy ranging in age from two to 17 years. . . . The purpose of the study was to restandardize the Templin test of final double consonant blends for use with children with cerebral palsy. Seven criteria were employed in the analysis: (1) the reliability of the observer, (2) the reliability of the test, (3) the validity of the test, (4) difficulty of the items, (5) their discriminating power, (6) their uniqueness, and (7) chronological and mental age progression in the scores. All criteria except age progression were met. . . . The difference between the mean scores of those rated very good and those rated very poor on general language ability was significant at the .001 level; the mean r for discrimination power was .67, the range was from .49 to .87; the mean r for the uniqueness of items was .32, the range was from .04 to .68; chronological and mental age progressions in the articulation scores were not present. The Templin test of final double consonant blends, like the test on initial double consonant blends, appears to

be quite adequate for use with children with cerebral palsy. (*Author's summary*)

612. IRWIN, O. C., Substitutions and omissions of final double consonant blends in the speech of children with cerebral palsy. *Cerebral Palsy Rev.*, 20(3), 1959, 6-7.

Comparison was made between 44 cerebral palsied children living in New England and 92 such children living in the deep South. Regional differences were found to be negligible. The differences between the mean scores for substitutions and for omissions in all cases was negligible, but the difference between the means of these errors for the New England cases was significantly in favor of substitutions. The most frequent substitution among final consonant blends was tr. The three most frequent omissions among these blends were sp, st, and sk. 'Presumably these are the final blends in the speech of children with cerebral palsy with which the speech therapist might be mostly interested.' (*Child Development Abst. Bibl.*)

613. IRWIN, O. C., Correct status of final double consonant blends in the speech of children with cerebral palsy. *Cerebral Palsy Rev.*, 20(3), 1959, 10-12.

The subjects were 160 children aged two to 17 tested on a list of 18 blends. Mean sex differences were not found but the variability of the girls was greater than that of the boys. Both chronological and mental age had little effect on the means of the scores. An analysis of the scores of 26 pairs of spastics and athetoids matched for age, sex, extent and degree of involvement showed no significant difference between the means or between the variances in the articulation of these blends. Concerning the effect of degree of involvement, the mean of the mild cases was statistically greater than that of the severe cases, but those between the mild and moderate and the moderate and severe were not significant. The variances were homogeneous. (*Child Development Abst. Bibl.*)

614. KEATS, S., Surgery of the extremities in the treatment of cerebral palsy. *G.P.*, 21(6), 1960, 86-88.

Increased emphasis on the conservative management of cerebral palsy—by physical therapy, exercises, and braces—has caused

misunderstanding concerning the use of surgery in the rehabilitation program. Surgical correction should be assessed for its possible contribution to the over-all program of treatment. It is now generally conceded that surgery of the extremities is most successful in patients with cerebral spasticity. Its use in the athetoid and the spastic extremity is considered, as well as the importance of 'timing' of the proposed surgery. Results of a comprehensive program for the treatment of cerebral palsy over a 10-year period at the New Jersey Orthopedic Hospital are discussed. (*Rehab. Lit.*)

615. LUBIN, B., A counseling program with adult, male cerebral palsied patients. *Cerebral Palsy Rev.*, 21(2), 1960, 3-5, 11.

A program of individual and group counseling with adult, male cerebral palsied patients was conducted at the Cerebral Palsy Clinic of the Indiana University Medical Center in an attempt to determine the feasibility and need for both methods of counseling. The group situation appeared to be more effective than individual counseling. The experiment indicated a need for concurrent counseling sessions with parents of the cerebral palsied patients. Problems of both patients and parents, as change was facilitated in the patients, are discussed. (*Rehab. Lit.*)

616. MECHAM, M. J., Measurement of verbal language development in cerebral palsy. *Cerebral Palsy Rev.*, 21(3), 1960, 3-4.

Because present language tests are limited in application to the handicapped child, the author has developed an informant-interview scale of verbal language development to determine the child's overall communicative abilities. The Verbal Language Development Scale was originally an extension of the Vineland Social Maturity Scale. After further modification, the new scale was standardized on a group of 120 children. Comparison with the normative sample for the Vineland Social Maturity Scale indicated that there was no significant difference between samples. Reliability and validity studies of the Verbal Language Development Scale indicated that the instrument met standard criteria. To determine further the usefulness of the scale parents of a group of 30 cerebral palsied children

were interviewed by the author. Evaluation of the reliability of the scale resulted in a Pearson Product Moment Correlation Coefficient of .960. No significant difference was found in mean language scores between mildly handicapped and severely handicapped children. Analysis of variance of language scores as a function of different mental age levels indicated significant differences. The author concludes that the Verbal Language Development Scale, having been previously found valid and reliable with both normal and feeble-minded children, can also be satisfactorily applied with cerebral palsied children. In this study, scores appeared to be affected only by mental age and not by severity of physical impairment. The author concludes that the influence of sensory defects or aphasia needs further study in relation to language scores. (*M.M.H.*)

617. MITCHELL, R. G., Medical aspects of a comprehensive survey of cerebral palsy. *Cerebral Palsy Bull.*, 7, 1959, 32-41.

A survey in Eastern Scotland of cases of cerebral palsy up to 21 years of age showed the incidence to be 2.0 per 1000. Of the 240 cases found, 42.7% were classified as mildly handicapped. By type 78.3% had spastic cerebral palsy, 37.1% had spastic hemiplegia, and 19.2% had spastic tetraplegia. Analysis of obstetrical histories showed an association between the cerebral diplegia syndrome and premature birth. Advanced maternal age and forceps delivery seemed important in the etiology of cerebral palsy, especially of the athetoid type. Of the 240 cases, 29 were of post-natal origin, the commonest causes being acute infantile hemiplegia, kernicterus or meningitis. (*Child Development Abst. Bibl.*)

618. STERLING, H. M., Muscle relaxants in cerebral palsy; a comparative study. II. Chlorophenylmethylthiazanone sulfone. (*Trancopal.*) *Arch. phys. Med. Rehab.*, 41(6), 1960, 226-228.

The second in the author's reports on various drugs used in the treatment of cerebral palsy (for first, see *Rehab. Lit.*, July 1960, #503). Four children between the ages of two and four years, having spasticity, athetosis, or both, affecting the control of the upper extremities, were given Trancopal three times a day for six weeks.

Three children similarly impaired received a placebo. Those receiving the drug failed to show any significant change that could be attributed to a drug effect. A specially selected test designed to show possible improvement in rate of manual manipulation was used to evaluate performance. (*Rehab. Lit.*)

619. WALLACE, H. E., The operation of a register for children with cerebral palsy. *Cerebral Palsy Rev.*, 20(2), 1959, 7-9.

A register is an up-to-date file containing services received, school placement information, hospitalizations, recommendations made, and action taken. A successful register requires that there be promotion of early case finding and reporting of patients. It has a role in the 'estimation of prevalence, provision of follow-up, evaluation of case finding, study of provision for services and unmet needs, use as a beginning in a retrospective study of etiology, study of results to the patient in evaluation of the effectiveness of the program, and study of referral of teen-agers and young adults for vocational services.' (*Child Development Abst. Bibl.*)

CLEFT PALATE

620. BLOCKER, T. G., Jr., and BLOCKER, V., *Speech Training for Cleft Palate Children* (third edition). Galveston, Texas: The University of Texas—School of Medicine, 1956. 58 p.

This booklet addressed to parents begins by reassuring them that no precautions could have prevented the child's cleft palate condition. Types of clefts of the lip and palate and their surgical repair are discussed and illustrated through drawings and photographs. Since the child needs speech instruction daily, parents must assume responsibility for the child's speech training as there are only a few speech centers in the country and public schools, with rare exceptions, neither feel nor assume this responsibility. Speech differences may jeopardize the child's personality development and his social and economic future. Lessons should be concentrated into one or two 15 to 20 minute periods daily with games at other times to encourage correct habits. Beyond this, no other attention should be given to the speech. The child should be

treated in a matter of fact way and taught to discuss his cleft palate in an objective fashion. The speech organs, voiced and voiceless, oral and nasal sound production are diagramed or discussed along with the difficulties created by the cleft of the palate. Classification of vowels and consonants according to place of production, manner of production, and voicing are provided in table form with phonetic symbols, dictionary symbols, and key words. Test phrases using excerpts from Mother Goose rhymes are listed with the key sound shown by a word as well as by its phonetic symbol. The lesson plans include a list of equipment needed, instructions for story telling and games, source materials for additional games and activities, blowing exercises, lip and palate exercises, drills for consonant sounds with a cue to be associated with the sound, lists of words for use in sentence drills for each consonant, and exercises to eliminate nasality, develop resonance, and relieve monotony. (*M.R.*)

621. BRAJNA, S., KAMIENSKI, R., and PONICKI, F., III, Wyniki leczenia rozszczepu wargi i podniebienia. (The results of treatment of harelip and cleft palate.) *Pol. Przegl. chir.*, 31(1), 1959, 39-44.

Good immediate surgical results were obtained in cases of harelip and cleft palate, using the methods of Blair-Mirault and Grob as modified by Kossakowski. Out of a total of 204 cases operated on for harelip and cleft palate, only a few cases required minor corrective operations after some time on the nasal alae, lips or palate. Immediately after operation for harelip, the wound is blocked by means of a 0.25% procaine solution with the addition of 200,000 U. of penicillin. The wound is kept dry by open treatment, and its surface is sprinkled with 96% alcohol several times a day. After operation for cleft palate for four days an obturator composed of several layers of gauze is placed on the palate adhering to the anterior part by means of collodium. On the third day the thin lateral gauze filters placed on the sites of the broken pterygoid hamuli are removed. The further care of the child requires direction to an orthodontist to fix a date for beginning treatment for the regulation of the bite and to a phoniatrician for the teaching of pronunciation. (*Excerpta Medica, XIX*)

622. BURIAN, F., *Proposta di una collaborazione internazionale per lo studio dei problemi inerenti alla labio-palatoschisi.* (Proposal for an international collaboration for studying the problems bound up with harelip and cleft palate.) *Minerva chir.*, Torino, 13, 1958, 931-932.

A study is made of the beneficial effects produced by modern surgery in cases of harelip and cleft palate, which while reducing the mortality and making it socially possible for these patients to get married, at the same time increases the possible transmission of this congenital malformation by the genes. It is, therefore, proposed that under the auspices of the UNESCO, on the recommendation of the International Society for Plastic Surgery, specialists in plastic surgery, pediatricians, stomatologists and psychiatrists study the genetic, hygienic, environmental, geological, geobiological, and meteorological factors which undoubtedly play a role in the causation of these malformations, and that likewise veterinary surgeons carry out experiments in this field. (*Excerpta Medica*, XIX)

623. BZOCH, K. R., *Clinical appraisal of cleft palate rehabilitation problems.* *J. Amer. dent. Assn.*, 60, 1960, 696-698.

The Northwestern University Cleft Lip and Palate Institute has adopted a modification of the classification system of Veau, the new system listing four major types of clefts plus a subgroup of unusual types. Rehabilitation of the patient with a cleft involves the correction of problems relating to speech defects, deformities in appearance, feeding, chronic otological conditions and upper respiratory infections. The solution usually requires the cooperation of all members of the cleft palate team, including the family dentist. (*Author's précis*)

624. CURTIS, E., *Cleft lip and palate in twins and offspring of twins.* *Cleft Palate Bull.*, 9, 1959, 60-61.

In an analysis of data on 124 pairs of twins, cleft lip (with or without cleft palate) was found in both twins in 43.5% of the monozygotic twins but in only 5.3% of the dizygotic pairs. The percentage of isolated cleft palate in both twins was about the same in the two groups. These results, together with those obtained from a study of children of 10 sets of twins, support a

theory of differential genetic influence in cleft lip (with or without cleft palate) and isolated cleft palate. (*Child Development Abst. Bibl.*)

625. FLETCHER, S., HASKINS, R., and BOSMA, J., *A movable bulb appliance to assist in palatopharyngeal closure.* *J. speech hear. Dis.*, 25, 1960, 249-258.

The authors describe a movable bulb prosthetic appliance designed to assist hypernasal voice subjects to achieve palatopharyngeal closure. The bulb is retained in the nasopharynx by two springs made of round stainless steel orthodontic wire. These springs extend from the palatal plate of the appliance along the oral surface of the soft palate to the tip of the uvula, and thence into the upper pharynx. By using two springs a reserve is provided to retain the bulb in the pharynx in the event of breakage of one wire. This appliance was used experimentally with five hypernasal subjects ranging in age from 4½ through 12½ years, who had developmental deficiencies of the palatopharyngeal structures. Considerable speech improvement was immediately apparent when the appliance was properly fitted. Radiographic comparisons between the subject at rest and phonating (o), with an without use of the appliance, indicated that ventrad movement of the upper pharyngeal wall occurred in three of the five subjects with the appliance in place. Without the appliance, this movement occurred only with swallowing. Three advantages of the movable appliance are hypothesized: (1) greater tolerance within the pharynx due to adequate correction for the posture of the head, (2) facilitation of pharyngeal wall motor response due to strengthened levator musculature action resulting from the slight resistance to palatal elevation offered by the bulb, and (3) enhanced palatal motion. (*S.I.G.*)

626. FRITZELL, B., *Speech improvement following palatoplasty with elongated pharyngeal flap.* *Folia Phoniat.*, Basel, 12, 1960, 118-123.

The problems of evaluating speech before and after palatoplasty are reviewed. The use of intelligibility tests comprising both phonetically balanced lists of monosyllables and tables of spondees is suggested for the

purpose of evaluating the post-operative speech in relation to the pre-operative speech. Consideration is also given to the use of Visible Speech Sound Spectrography for the quantitative measurement of post-operative speech. A surgical technique of palatoplasty with an elongated pharyngeal flap is described. The surgeon 'raises' a long flap which has its lower margin at the level of the cricoid cartilage and reaches at the upper margin the alveolar processes. (J.B.R.)

627. GREEN, R. I., The radiological appearances of the soft palate with reference to the treatment of cleft palate. *J. Fac. Radiol.*, London, 10, 1959, 27-39.

A brief description of the mechanism of action of the nasopharyngeal sphincter is followed by a presentation of the radiological technique as recommended by the author. Radiographs are made with the patient sitting, sometimes without contrast medium, and sometimes with barium sulphate suspension. The exposure factors are: 200 mA, 78-80 kv., 0.1 sec., f.f.d. five feet, one mm. Al, coned tube. Series of films are taken, first at rest and then while the patient pronounces certain isolated sounds, etc.; usually seven films are exposed. Further, the normal appearance and the appearance of the soft palate after operation for cleft palate are outlined, the text being accompanied by a series of instructive radiological pictures. (*Excerpta Medica*, XI)

628. HESS, D. A., and McDONALD, E. T., Consonantal nasal pressure in cleft palate speakers. *J. speech hearing Res.*, 3, 1960, 201-211.

Nasal manometric readings were obtained from 20 cleft palate speakers articulating CV monosyllables and CVCVCV trisyllables. The test included 24 consonants, each combined with a constant vowel, (a). The following conclusions appear defensible: consonants normally requiring greater intraoral pressure involve greater nasal pressure when articulated by cleft palate speakers. Mean nasal pressure for consonant types ranks from highest to lowest as follows: affricates, fricatives, plosives, nasals, and glides. Voiceless sounds, considered as a group, involve greater nasal pressure than their voiced counterparts. Consonantal misarticulations in cleft palate speakers most

frequently reported by different investigators involve consonants with higher mean nasal pressure. Nasal pressure of individual subjects on 10 consonants-in-trisyllable tends to predict each subject's rank in average nasal pressure. Nasal pressure readings for these consonants may provide diagnostic information about functional velopharyngeal valving for connected speech. However, diagnosis of audible nasal emission remains a matter for clinical judgment. (*Authors' summary*)

629. MITRINOWICZ-MODRZEJEWSKA, V. A., Physiologie und Pathologie der Resonanzräume (Physiology and pathology of the resonating cavities.) *Folia Phoniat.*, Basel, 12, 1960, 107-113.

Speech production involves a chain of conditioned reflexes which convey sensory impulses from the peripheral receptors to the central nervous system and from the central nervous system to the effectors, the muscles of respiration, phonation, and articulation. The individual resonating cavities form a closely integrated system. The disturbance of resonance in cleft palate speech is not occasioned merely by the pathology of the mouth cavity, for functional changes are found in the larynx too. The function of the air-filled cavities of the laryngeal structures is asymmetrical and asynchronous. (J.B.R.)

630. OLMSTED, R. W., HALFOND, M. M., and KIRKPATRICK, J. A., Isolated palatal paralysis. *J. Pediat.*, 56, 1960, 795-799.

The paper presents the cases of three children, ages 11 to 13 years, with speech defects similar to defects associated with clefts of the palate. These children manifested 'isolated palatal paralysis' so-called because of the absence of other obvious neuromuscular weaknesses. The following clinical description of the cases is given. Initial signs of palatal paralysis were regurgitation of milk through the nares shortly after birth. Speech from onset was hypernasal and unintelligible. Age at which words were first attempted appeared unrelated to palatal defect. Two palates were of normal configuration, one was slightly foreshortened. Texture and color of the palates did not suggest submucous clefts. Uvulae were in the midline and normal in

appearance. There was complete absence of motion in one case and minimal palatal motion in two cases. These minimal movements were symmetrical. Excessive drooling and disturbance of the gag reflexes were not noted. A discussion of pathology is given. The conclusion is made that the absence of other neuromuscular weakness makes differential diagnosis of 'isolated palatal paralysis' from other palatal involvements less difficult. Etiology of 'isolated palatal paralysis' is discussed. Site of the pathological involvement is unknown, and no evidence is available to suggest the cause or causes. Cinefluorographic observations of the palates revealed inadequate activity for effecting a velopharyngeal closure in all cases. There was complete absence of palatal movement during phonation in one case, a slight amount of movement indicative of levator muscle activity in another case. The greatest amount of movement was noted in the third case although velopharyngeal closure was not effected. Treatment is aimed at effecting a more adequate velopharyngeal closure. In one case closure was accomplished by the pharyngeal flap procedure. In two cases prostheses were used to elevate the dependent soft palate and narrow the velopharyngeal space. Speech seemed improved in one of the children while the other child would not tolerate the prosthesis. While all cases received speech therapy it is felt that speech training per se cannot overcome the velopharyngeal insufficiency. Improvement in quality of speech was observed in all cases however. Emotional problems of varying degrees were present in each case. Concern with early feeding disturbances and speech disorders may have caused or intensified disturbed parent-child relationships. The need for early recognition and treatment is stressed. (N.J.C.)

631. OLSEN, N. H., Responsibility of the general practitioner to the cleft palate patient. *J. Amer. dent. Assn.*, 60, 1960, 706-710.

The general practitioner of dentistry should not hesitate to assume responsibility for maintaining in optimum health the teeth and supporting structures of the patient with a cleft palate. Lack of adequate dental care jeopardizes the balance of the treatment program. Special problems

which may be encountered in treatment of the patient with a cleft palate include tautness of the obicularis oris muscle, nasal congestion, malalignment of teeth, supernumerary teeth, and soft tissue disturbances. An understanding of growth and development is important. Each child must be considered as an individual. (*Author's précis*)

632. ORTIZ-MONOSTERIO, F., SER-RANO, R. A., VALDERRAMA, M., and CRUZ, R., Cephalometric measurements on adult patients with non-operated cleft palates. *Plast. Reconstr. Surg.*, 24(1), 1959, 53-61.

Cephalometric studies performed in 19 adults with nonoperated cleft palates indicate that the forward growth of the upper maxillae is the same as or greater than in normal cases. The increased maxillary protrusion can be explained by the lack of retention action effected by the normal muscle continuity of the lip. A greater than normal Frankfort-mandibular angle was found in non-operated adults than in normal subjects. The average facial angle was comparable to the normal angle, indicating an adequate craniofacial proportion. In spite of the limited number of cases presented in this preliminary report, it seems feasible to draw some conclusions. The embryonic factor responsible for the facial cleft does not interfere with maxillary growth. This evidence suggests that growth defects of the middle third of the face are caused by early or repeated and aggressive surgery. It seems probable that a greater percentage of good results can be obtained if palate surgery is postponed until the patient's facial development is quite well advanced, and the age is still compatible with a good speech therapy program. (*Excerpta Medica*, XI)

633. PERELLÓ, J., Contribution casuistique à la pathologie du voile du palais. (Accessory causes of palate pathology.) *Folia Phoniat.*, Basel, 12, 1960, 113-117.

Abnormalities of the palate, other than the palatal cleft, which give rise to speech disorders are considered. Attention is given to submucous clefts, congenital hemiparalysis, surgical trauma, dental abnormalities, and malformations. Representative case

histories with symptoms and treatment are presented. (*J.B.R.*)

634. PIRRUCCELLO, F. W., Primary surgical correction of congenital clefts of the lip and palate. *J. Amer. dent. Assn*, 60, 1960, 699-703.

No one procedure for surgical closure is adequate for all types of palatal clefts. The use of prosthetics is elective in instances of gross tissue deficiency. Surgical treatment of cleft palate always is the method of choice whenever its goals can be reasonably attained. The surgical method selected depends largely on the extent of the cleft and on anatomic and physiologic details of the related parts. Two case reports illustrate some of the problems encountered in the surgical management of cleft palate. (*Author's précis*)

635. ROSEN, M. S., Prosthetics for the cleft palate patient. *J. Amer. dent. Assn*, 60, 1960, 715-721.

Five case reports illustrate the use of stable, one-piece prosthetic speech appliances to help the cleft palate patient. Three basic types of speech aids are constructed at the Cleft Lip and Palate Institute of Northwestern University; two are temporary appliances for children and the third is a permanent appliance for adults. (*Author's précis*)

636. ROSENSTEIN, S. W., Orthodontic treatment for the cleft palate patient. *J. Amer. dent. Assn*, 60, 1960, 711-714.

Often, the deciduous arch of the cleft palate patient is treated orthodontically, to achieve the maximum alveolar growth potential and component. Even if the patient has to be treated orthodontically again at a later age, the problem will be less severe and the prognosis better in the permanent dentition. Second-phase orthodontic treatment usually can be coordinated with other treatment procedures of the team. Orthodontic treatment technics differ little from those for the patient without a cleft palate. (*Author's précis*)

637. STUTEVILLE, O. H., Secondary surgical procedures in cleft palate treatment. *J. Amer. dent. Assn*, 60, 1960, 722-726.

Three case reports illustrate the results obtained by coordinated treatment in the

rehabilitation of older cleft palate patients for whom earlier treatment was incomplete or inadequate. (*Author's précis*)

638. WESTLAKE, H., The speech pathologist of the rehabilitative team. *J. Amer. dent. Assn*, 60, 1960, 703-705.

The results that a speech pathologist can obtain are limited by the oral structure. Particular training and experience are necessary to understand the cleft palate problem. The patient with a cleft palate should receive speech training as early as possible. The speech pathologist should recognize the crucial role of velopharyngeal valving in the production of speech. (*Author's précis*)

639. WUSTROW, F., Prothetische und operative Versorgen grosser Operationsdefekte am Gaumen und im Oberkieferbereich im Hinblick auf das Kauen, Sprechen, Schlucken und die Kosmetik. (Prosthetic and operative care for big operational defects of the palate and maxilla with respect to chewing, talking, swallowing and cosmetics.) *HNO*, Berlin, 8, 1960, 347-351.

The operative removal of tumors of the palate, the alveolar process and the vestibule of the mouth offers the best permanent result. The defects resulting from the operation must be covered either surgically or prosthetically. There are four possible groups of defects: (1) soft palate, (2) hard palate or alveolar process, (3) unilateral defects after removal of the maxilla extending to the ethmoid and sphenoid and the contents of the orbita, and (4) bilateral defects of the face. All these defects may produce difficulties in chewing and swallowing (especially of liquids), and may also bring about rhinolalia aperta, to say nothing of the cosmetic problem. The post-operative task consists of closing off the mouth cavity from the operative defect and of closing the epipharynx off from the cavity resulting from the operation. These post-operative procedures should be taken into consideration during the operation of the tumor. In simple defects of the soft palate a prosthetic plate which has a posterior tongue-like prolongation to bridge the defect is sufficient. This prolongation should, of course, not touch the posterior wall of the pharynx. If there is a remnant of a uvula the tongue-like prolongation

should push it as far back as possible. In defects after unilateral removal of the maxilla without destruction of the velum the covering of the defect with an obturator is possible in most cases. After resection of the maxilla a part of the obturator has to go up into the pharynx. A small tongue-like prolongation serves to make contact with the velum. If the velum and maxilla have been totally removed the prothesis must close up the nasopharynx. If the tumor necessitated the removal of the lower septum or the other side of the floor of the nose or parts of the other maxilla, the obturator must close off the mouth from the nose and yet not prevent nose breathing. Description of the operative procedures should be read in the original (E.F.)

DELAYED SPEECH

640. GREENE, M. C., Diagnosis and treatment of late speech and language development in children. *Folia Phoniat.*, Basel, 12, 1960, 101-107.

Speech disorders are differentiated from language disorders. Speech disorders may be signaled by motor signs. Language disorders may be signaled by neuro-psychological signs. Speech assessment alone provides essential diagnostic clues which may be supplemented with performance and intelligence tests. The emphasis in treatment should not be the same for both speech and language disorders. Adequacy of treatment is dependent upon adequacy of diagnosis. (J.B.R.)

LARYNGECTOMY

641. BARROILHET, J., FRENK, S., and HOLMGREN, B., Vocal chord vibrations and EMG recorded in man after partial laryngectomy. *Pract. Oto-Rhino-Laryngol.*, Basel, 22(4), 1960, 244-247.

The authors' observations seem to favor the conclusions of the several authors who hold that no strict correlation can be made between the EMG of the vocal muscle and the vibrations of the cord, and that in the absence of air currents the vocal cords do not vibrate in a fashion that might allow one to state that the contraction of the vocal muscle fibers is the active element in determining the frequency of the cord vibrations, and thus the tone of the sound

emitted, as is maintained by the myoclonic theory. (Authors' summary)

642. BERGER, F., Über somatische Beschwerden nach Laryngektomie. (Somatic difficulties after laryngectomy.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(8), 1960, 499-504.

The patient's point of view of the effect of laryngectomy on the general organism was studied in 40 cases. Many patients found the secretions from the tracheostome more unpleasant than the loss of voice. Most patients experienced varying degrees of dyspnoea on effort, the cause of which is not understood. The undisturbed sense of taste and smell is ascribed to a continuous stream of air between the mouth and nose on the principle of draught up a chimney. (Author's summary)

643. BÖHME, G., and SCHNEIDER, H.-G., Die Pathophysiologie des Laryngectomierten in Zusammenhang mit der Güte der Sprechfunktion. (Pathophysiological problems of patients after laryngectomy in relation to the quality of the acquired speech.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(8), 1960, 512-520.

The patho-physiological problems of patients after laryngectomy are reviewed in the light of the published literature. Twenty cases operated for carcinoma have been examined. The Freiburg speech test and a special X-ray technique were used. Both methods yielded comparable results regarding the quality of the acquired speech. This complex function was discussed by considering the local and general factors affecting the pharyngo-oesophageal voice. (Authors' summary)

644. DESMOND, T., The voiceless speak again. *Today's Health*, 1960, 30-31.

In simple lay language the speech training program for a laryngectomized person is outlined with some reference to the social and psychological problems. (E.H.N.)

645. HASS, W., Die 'Sprechspange für Kehlkopflose.' (A speech clasp for alaryngeal people.) *HNO*, Berlin, 9, 1960, 26-27.

An instrument, constructed by a laryngectomized male patient, is made of celluloid, and is six by three cm. in size with perforations for breathing. It is held over

the tracheostoma by a linen neck band. The instrument improved esophageal speech very remarkably. The writer supposes that it produces some pressure upon the outer throat muscles and also works inwardly, narrowing the esophageal mouth. (*E.F.*)

646. SIROKY, J., *Ergebnisse der Re-education der Stimme nach der Laryngektomie.* (Re-education of the voice after laryngectomy.) *Z. Laryngol. Rhinol. Otol.*, Stuttgart, 39(8), 1960, 504-512.

Eighty-one and one tenth per cent of 138 laryngectomized patients have acquired good oesophageal speech, 15.1% speak with an incomplete and incorrectly produced voice, while only 3.8% have failed to learn oesophageal speech. Details are given of experiments with oesophageal spirometry and pneumography. It was found that the oesophagus filled with air more readily, and the separation of phonatory from respiratory movements was achieved more effectively after increasing intervals of time following re-education. The probable causes of failure to acquire speech in five cases are discussed. Among the causes were: infiltration of the front of the neck and pharynx, marked retraction of the root of the tongue backwards and downwards hindering the intake of air into the oesophagus, and pain after postoperative radiotherapy. (*Author's summary*)

647. TAIT, V., and TAIT, R. V., *Speech rehabilitation with the oral vibrator.* *Speech Pathol. Ther.*, London, 2(2), 1959, 64-69.

An oral vibrator, consisting of an upper dental prosthesis containing an electromagnetically vibrated diaphragm connected from the mouth with a battery-operated audio-oscillator, was designed for laryngectomized patients unable to develop oesophageal speech. The apparatus is considered to be less conspicuous and more convenient than previous artificial larynxes, and to produce better intelligibility. Methods of training patients in its use and instructions for maintenance are included. (*Excerpta Medica, XIX*)

STUTTERING

648. ADLER, S., *Stuttering; its source and its solution.* *Nursing World*, 134(6), 1960, 18-21.

The author, Director of East Tennessee State College's Speech and Hearing Clinic, offers some facts, now fairly well established, on the nature of stuttering and the management of the stutterer. Written for the public health, school, or pediatric nurse, it advises on general handling of the stuttering child and problems the adult stutterer must overcome. Parents also could profit from the discussion the author presents. (*Rehab. Lit.*)

649. BLOODSTEIN, O., *The development of stuttering: 1. Changes in nine basic features.* *J. speech hear. Dis.*, 25, 1960, 219-237.

Data regarding repetitions, hard contacts, associated symptoms (e.g., eye blinking, fist clenching, tension of the respiratory muscles, etc.), fluent periods, difficult speaking situations, difficult words and sounds, anticipation, word substitution, and avoidance of speech and other signs of emotional reaction to stuttering were collected by the author from clinical records of 418 stutterers, ages two through 16. A table is included summarizing the percentage of cases appearing to exhibit each of these stuttering features at the various age levels. Additional findings considered significant by the author are summarized as follows: (1) Pressure symptoms and associated mannerisms appear in case records of different subjects by age five, sometimes as the essential stuttering feature, although simple repetition is a dominating early symptom. (2) Hard contacts or pressure symptoms are sometimes reported by parents to be the earliest noticed symptoms. (3) The tendency to repeat whole words, especially at the beginning of the sentence, and to have difficulty with prepositions, pronouns and conjunctions, although conspicuous in younger subjects, tend to disappear in time. (4) Associated symptoms, sometimes of the most strenuous and complex type, occur in a large number of children well before strong feelings of fear or embarrassment as evidenced by avoidance of speaking. (5) Release devices are the earliest associated symptoms to develop in the large majority of cases, and the most common at all ages. (6) In its earliest forms stuttering is an episodic type of disorder in the majority of cases. (7) Although conscious anticipation, word substitution and

awareness of difficult words or sounds generally are advanced features of stuttering, there is indirect evidence that they may appear at a very early age in some cases.

(8) The consistency effect appears at every age level, and in children who do not consciously anticipate their blocks—even those with relatively simple repetitions, who are sometimes regarded as 'unaware' of their stuttering. (9) Word substitution, like associated symptoms, frequently develops prior to the development of chronic fear of stuttering, and may occur initially merely as a reaction to the frustration of blocking. (10) Although chronic fear of stuttering is one of the last features of the disorder to develop, acute emotional reactions may be seen from time to time in the youngest stutterers. (11) There appears to be evidence that essentially all children commonly referred to as stutterers possess some degree of awareness of their speech difficulty. (12) Reactions to stuttering may appear in roughly four developmental stages: (a) little overt reaction under most conditions and essentially no self-concept as a stutterer; occasional acute reaction to the speech interruption itself, (b) self-concept as a stutterer with no emotional reactions under most conditions, (c) emotional reactions of annoyance, frustration, disgust or anger, (d) emotional reactions of fear and embarrassment. (S.I.G.)

650. De SANTIS, M., *Ricerche endocrine in soggetti affetti da balbuzie.* (Endocrine research into cases of stammering.) *Valsalva*, 35(6), 1959, 328-333.

The pathogenesis of stammering is far from clear. The author carried out endocrine research (gonadotropine, 17-ketosteroids, urinary dehydroisoandrosterone) in 20 male patients suffering from stammering. He was led to undertake this research by the observation that stammering occurs almost constantly in males. The 17-ketosteroids were found to be diminished in 12 cases (primary hypogonadism). The gonadotropins were diminished in three cases and dehydroisoandrosterone in one case (secondary hypogonadism and hypopituitarism and hypocorticalism). Endocrine changes observed in altogether 16 out of 20 cases of stammering allow us to put forward as at least a probable hypothesis that endocrine changes in the sexual sector,

more often primary but occasionally secondary, play an active part in the aetio-pathogenesis of stammering. (*Excerpta Medica*, XI)

651. FLANAGAN, B., GOLDIA-MOND, I. and AZRIN, N., *Operant stuttering: The control of stuttering behavior through response-contingent consequences.* *J. exp. Anal. Behav.*, 1, 1958, 173-177.

Three male stutterers were subjects. When termination of a noxious stimulus (loud noises) was made contingent upon stuttering, response rate rose. When onset of the noxious stimulus was made contingent upon stuttering, response suppression occurred, showing compensation with cessation of consequences. (*Psychol. Abst.*)

652. OCKEL, H. H., *Zum problems des stotterns.* (The problem of stuttering.) *Prax. Kinderpsychol.*, 8(6), 1959, 213-223.

Extensive review of publications by German and English-speaking authors on stuttering, classified according to the predominantly heredosomatic and depth-psychological conception of the pathogenesis. In the exposure of phenomenological works, stress is laid on the difference and the relationship between stuttering and sputtering. Personal cases are reported and the structure of the neurosis is described. An outline is given of the frequent (emotionally unsatisfied, overcompensated) mother figure and three variations of the father figure of stutterers. (*Excerpta Medica*, XI)

653. PALASEK, J. R., and CURTIS, W. S., *Sugar placebos and stuttering.* *J. speech hearing Res.*, 3, 1960, 223-226.

The use of lactose placebos in stuttering research was investigated. Nine stutterers read a short passage five times under a control condition and under three experimental conditions after taking placebos: (a) 11 grains of lactose, (b) 11 grains of calcium carbonate, and (c) a combination of 5.5 grains of lactose and 5.5 grains of calcium carbonate. The criterion measure was frequency of stuttering. By statistical analysis no significant differences were found either among readings or among conditions. Further research with more subjects is suggested since the observed differences indicate the possibility that stuttering frequency might be decreased

by the administration of lactose. (*Authors' summary*)

654. SCHILLING, Von A., Röntgen-Zwerchfell-Kymogramme bei Stotterern. (X-ray-kymographic investigation of the diaphragmatic action of stutters.) *Folia Phoniat.*, Basel, 12, 1960, 145-153.

The diaphragmatic movements of 35 stutterers are investigated using an X-ray-kymographic technique. Sixteen of the group showed pathological movements in quiet breathing. Short, spastic muscle contractions, of a partially clonic nature are irregularly interspersed in the normal breathing rhythm. The relationships with simultaneous EEG'S and neurological observations are examined. (*J.B.R.*)

655. WOLF, A. A., and WOLF, E. G., Feedback processes in the theory of certain speech disorders. *Speech Pathol. Ther.*, 2(2), 1959, 48-55.

Premising three types of stuttering, periodic, aperiodic and random, the authors consider them as the effect of a discontinuity in the feedback system of speech. This discontinuous response is caused by a dead-time lag between input and output, which means a delay in the path leading from brain impulse via speech center and effectors back via hearing center to 'speech storage center' (memory), the 'switch' between the last two stations being closed when it should be opened. In a speech model this can be analyzed and studied with mathematical equations. The cause of the delay is supposed to be of organic nature in 'random stuttering' and in aphasia, whereas in periodic and aperiodic stuttering the connectors are mainly psychologically controlled and therefore disturbed by emotional factors. Treatment of stuttering and of aphasia, to which much the same considerations are applicable, should aim at improving the speech as a whole by introducing delays at other points in the feedback system, neutralizing the original dead lags. In future this will probably be performed by a team of engineer and surgeon, the former designing a compensatory network, the latter connecting nerve-like tissue to the proper parts of the brain. (*Excerpta Medica, XIX*)

VOICE DISORDERS

656. BECK, J., and SCHÖNHÄRL, E., Eine seltene Art der Ersatzstimmbildung. (A rare type of substituted voice production). *Medizinische*, 38, 1959, 1742-1744.

Two cases in which speech was disturbed as a result of traumatism are reported. Vibration of the mucous membrane in the narrowed entrance to the larynx caused by a current of air led to the production of a substituted voice. The pseudoglottis was formed anteriorly by the petiolus epiglottidis and posteriorly by the mucous membrane of the arytenoid cartilage and ran in transverse direction. Stroboscopy revealed a rolling movement of the mucous membrane from below upwards. It is believed that this movement plays a role in the vocal timbre (frequency spectrogram). In addition to the esophageal voice and the voice due to ventricular bands, this mechanism is designated as a third type of substituted voice. (*Excerpta Medica, XIX*)

657. DAMSTÉ, P. H., and HUIZINGA, E., Stroboscopic fixation of the vocal cords. *Practica Oto-Rhino-Laryngol.* Basel, 21, 1959, 349-354.

After a short history of stroboscopy the reasons why this method has never become generally adopted among laryngologists are discussed. A reliable picture is obtained with the stroboscope now in use at Groningen, which has been considerably improved by the physicist Van den Berg. The important symptoms of stroboscopic fixation of the vocal cords is mainly found in carcinoma. It is an early symptom. After successful irradiation the vibrations usually return, this being important for the prognosis. (*Excerpta Medica, XI*)

658. De QUIROS, J. B., SISATZKY, D. P. y F., and TORMAKH, E., Consideraciones sobre la evolución y la terapéutica de los nodulos de las cuerdas vocales. (Considerations upon the evolution and therapy for nodules of the vocal cords.) *Fono Audiologica*, Buenos Aires, 6, 1960, 29-47.

In this paper the authors analyze the evolution of 150 cases of nodules treated by rest, potassium, use of certain substances (which are able to introduce potassium into the cells), vitamin and hormone therapies, and autonomic regulation. They consider

that this treatment gives a very high percentage of recoveries if it is accompanied by adequate training in voice production. . . Vocal abuse is the most frequent factor eliciting the appearance of nodules. This factor may act directly on a healthy larynx or indirectly on a larynx stressed by infectious factors, endocrine factors, etc. In the 150 cases of nodules the laryngoscopic examination showed that 114 were bilateral and 36 unilateral. Of the 114 bilateral nodules, 92 were kissing nodules; the others did not present the characteristic of simultaneity, equality, and symmetry of the former; in two cases the bilateral nodules were not at the same level, but one before the other. The authors consider that the unilateral nodules probably would be of a pathogenesis different from that of the kissing nodules. The stroboscopic examination can exaggerate the presence of the hiatus and can show diminution (instead of augmentation) of the amplitude in the vibration of the vocal cords. Finally the authors consider that clinical treatment, pharmacological and rehabilitary, must be chosen in nodule therapy. In rare cases where operation is the only possible solution, nodule relapse can be avoided by clinical treatment. (*Authors' précis*)

659. GARDE, E., *Nuevas consideraciones sobre los nódulos y pólipos de las cuerdas vocales*. (Recent considerations upon nodules and polyps of the vocal cords.) *Fono Audiologica*, Buenos Aires, 6, 1960, 3-28.

The author advocates a multidisciplinary approach to the treatment of nodules upon the vocal cords. Treatment includes correcting phonatory habits, nerve physiology, and endocrine imbalance. The approach is thus local, general, and functional. The author advocates that the several disciplines be represented in one person who is managing the patient. (*M.S.W.*)

660. KNIGHT, J. S., *Cricothyroid dislocation*. *Laryngoscope*, 70, 1960, 1256-1267.

Dislocation of the cricothyroid joint is rare. When it does occur from unusual stretching movements or from trauma the symptoms may include discomfort in the neck, referred pain in the ear toward which the thyroid notch is rotated, some difficulty in swallowing, and a husky voice. Normal

relocation can be accomplished by manipulation or by minor surgery. (*R.G.*)

661. MASURA, S., *Odlúpnutie sliznice hlasiviek*. (Operative removal of the mucosa of vocal cords.) *Bratisl. Lek. Listy*, 39, 1959, 635-638.

Using Lore's method in three patients the mucosa of the surface of both vocal cords was operatively removed in one session, without adhesions in the anterior commissure. In another patient the mucous membrane of one vocal cord was operatively peeled off, in a third only from the surroundings of the peduncle of a vocal cord polyp. All three patients were improved and the voice was clear. (*Excerpta Medica*, XI)

662. MOSES, P. J., *Reorientation of concepts and facts in phonetics*. *Logos*, 1, 1958, 45-51.

The kymograph has fallen into disuse for studying phonetics. It is necessary to study the psychogenic roots of phonation. The child's vocal development retraces the vocal development of the species. At every step in this growth process a neurosis can develop. Some emotional disturbances may cause the patient to regress to a phase that gave greater security, and often the regression will be expressed through vocal means that belonged to the earlier stage. If the patient, for psychogenic reasons, remains fixed at a certain stage of development and unconsciously refuses to take the next step, his voice will often persist at this symbolic stop, and a persistent falsetto voice, for example, will bear witness to his unsuccessful transition from boyhood to manhood. It reveals a fixation to the mother which disturbs the normal resolution of the Oedipus complex. Voice is an indicator of physical, psychical and sexual development. Glottal stroke is an exaggerated impulse, a symbol of aggression, of hitting, almost spitting tendencies. The concept of phonasthenia, therefore, needs complete reorientation. The mechanistic theories are now wholly outdated, because weakness of the voice can result from psychogenic causes. The term myasthenia has no meaning and obscures the actual pathogenesis. Phonasthenia is a neurotic symptom. For this reason, phoneticians

should have knowledge of psychology and psychotherapy. (*Excerpta Medica*, XI)

663. PERONE, P., Sui metodi di cura delle stenosi laringee dovute a posizione mediana permanente delle due corde vocali. (Methods for the correction of laryngeal stenosis due to permanent median position of the vocal cords.) *Ann. Laringol. Otol. Rinol. Faringol.*, Torino, 59(2), 1960, 195-212.

After a review of different procedures used for the correction of laryngeal stenosis due to permanent adduction of the vocal cords, a description is made of a method of arytenoidectomy and cordopexy through laryngofissure. Mention is made to the advantages of this method over similar procedures done via the extralaryngeal approach. (*Author's summary*)

664. ROBE, E., BRUMLIK, J., and MOORE, P., A study of spastic dysphonia. Neurologic and electroencephalographic abnormalities. *Laryngoscope*, 70, 1960, 219-245.

(1) Ten patients with spastic dysphonia were studied with neurologic examinations and electroencephalograms. (2) Every patient had signs of central nervous system disease, with suggestive specific clinical entities in four cases. (3) Ninety per cent of electroencephalograms were abnormal, with the disturbance generally being paroxysmal in the right temporal-parietal area. (4) The authors consider spastic dysphonia to be a symptom of disease of the central nervous system, both from the standpoint of this study and from the clinical and experimental facts in the literature. (5) It is proposed that there is a specific disturbance in the pathways for speech production, in some cases perhaps on a post-encephalitic basis. (*Authors' summary*)

665. SCIUTO, G., Sulle vasculopatie cordali da trauma vocale. (Vocal cord vasculopathies from vocal traumatism.) *Il Val-salva*, Rome, 36(3), 1960, 144-150.

Starting from the clinical observation of laryngopathies from vascular origin, the author examines the local anatomical predispositions and the mechanisms which operate in giving rise to a vascular lesion at the level of the vocal cords. Afterwards the author points out the most vulnerable

site, namely the most frequently affected by the contrasting forces brought about during an incorrect and strained emission of voice. (*Author's summary*)

GENERAL

666. ALTEMUS, L. A., Frequency of the incidence of malocclusion in American Negro children aged 12-16. *Angle Orthodont.*, 29, 1959, 189-200.

Based on 3289 children in four junior and senior high schools of Washington, D.C., with permanent dentitions and who had received no orthodontic care. Malocclusion was assessed in two ways: (1) counting of teeth out of normal occlusal alignment; (2) classification via the Angle system. It was found that 83% had malocclusion, 4% had 'ideal' occlusion, 13% had 'normal' occlusion. This compares with white children: 80%, 3%, 17%, respectively. There are fewer maloccluded teeth per child in Negroes, i.e., 6 per child as against 10 per child in whites. In the Angle classification Negro children have fewer Normal, Class II, Division 1, and Class III malocclusions. (*Child Development Abst. Bibl.*)

667. AZRIN, N. H., Some effects of noise on human behavior. *J. exp. Anal. Behav.*, 1, 1958, 183-200.

When noise, or its absence, was used as a discriminative stimulus for the target, responding came under the control of the noise, or its absence. Similarly, when intense noise, or its absence, was made contingent upon responses, the pattern and frequency of responding were found to vary as a function of the conditions of noise presentation. When the noise was not presented in some differential relation to the target or the response, its major effects were transient and largely predictable on the basis of stimulus change. (*Psychol. Abst.*)

668. BAMBHA, J. K., and VAN NATTA, P., A longitudinal study of occlusion and tooth eruption in relation to skeletal maturation. *Amer. J. Orthodont.*, 45, 1959, 847-855.

After careful statistical analysis it is concluded that malocclusion does not occur more frequently in maturational laggards,

nor is there more severe malocclusion when it does occur. There is no correlation between times of tooth eruption and skeletal maturation or between tooth eruption and severity of malocclusion. (*Child Development Abst. Bibl.*)

669. CANTOR, G. N., and GIRARDEAU, F. L., Rhythmic discrimination ability in mongoloid and normal children. *Amer. J. ment. Def.*, 63, 1959, 621-625.

Forty-four mongoloids, mean CA of 12-4 and mean MA of 4-4, and 24 non-retarded, mean CA of 4-8 and mean MA of 5-6, were exposed to 60 presentations of eight metronome beats, 30 at a rate of 120 beats per min. ('fast') and 30 at 88 beats per min. ('slow'). Half of each group were required to tap with the metronome beats. The task was to identify each stimulus presentation by means of the proper label. Both mongoloid and normal groups did significantly better than would be expected by chance, but the normals significantly exceeded the mongoloids in performance, although the normal group had an MA level significantly above that of the mongoloids. The presence or absence of tapping had no significant effect on performance. The results call into question the commonly expressed generalization that mongoloids are characterized by a 'marked' sense of rhythm. (*Authors' summary*)

670. CLARK, R., and POLISH, E., Sound production by the satinfin shiner, *Notropis analostanus*, and related fishes. *Science*, 132(3421), 1960, 222-223.

Evidence was obtained to demonstrate that several sounds are produced by freshwater minnows. Only one appears to be 'biological,' all others appear to be 'mechanical,' ranging from 85 to 11,000 C.P.S. and lasting from 11 to 60 msec. (*F.R.*)

671. COBET, H., ECKERT-MÖBIUS, A., and JULICH, H., Das Verhalten der Blutgase des Milchsäurespiegels bei experimenteller Behinderung der Nasentmung. (Blood gases and milk acid during experimental obstruction of nose breathing.) *HNO*, Berlin, 8, 1960, 297-300.

Since there has been so much written about the unfavorable influence of mouth breathing this article is also of importance to the speech and voice therapist. Accord-

ing to Lüscher the disadvantage of mouth breathing is due to a diminished oxygen supply to the tissue because of the missing reflexes which are produced by air entering the nose. Therefore too much acid will be in the tissue. Yet von Eisfeld and Julich doubted that a higher degree of milk acid can be due to lack of oxygen. The writers of this article try to answer the following questions: (1) Does experimentally obstructed nose breathing produce acidosis? (2) Does it lead to a disturbed gas exchange? The subjects, in supine position, were prevented from nose breathing for one hour. The venous blood was taken from a vein of the arm, and arterial blood, under local anaesthesia, from the femoral artery. Experiments were done on 25 subjects of both sexes. The results are that there is no change in the blood gases and milk acid during the transition from normal nose breathing to mouth breathing. Therefore it is not probable that the advantage of nose breathing over mouth breathing is due to a change in the gas exchange. That children with chronic mouth breathing are frequently tired and cannot concentrate very well is explained on the basis that the tongue falls back during sleep, obstructing breathing and waking the child. In addition, the mucous linings in the lower respiratory tract are irritated. Furthermore it has been proved by Samzelius-Lejdström and others that inspiration through the nose produces a better tension of the breathing muscles and in this way greater depth of inspiration. (*E.F.*)

672. DICKSON, E. D. D., Industrial noise—an analysis of the problem. *J. Laryngol. Otol.*, 74, 1960, 408-419.

This paper is an informal summary of the deliberations of a sub-committee set up by the Council of the British Association of Otolaryngologists. Points considered include (a) pre-employment examination, (b) periodic audiometry, (c) advantages and limitations of ear protectors, (d) need for indoctrination of management and employees on noise hazard, (e) problems in allowing for presbycusis, and (f) problems in assessment of hearing loss for compensation. Frequent reference is made to work done and legislation passed in the U.S.A. (*C.L.*)

673. ERICH, J. B., Plastic and prosthetic repair for patients with complete loss of the lower jaw. *Laryngoscope*, 70, 1960, 523-532.

A description is given of an intra-oral prosthesis for patients with complete loss of the mandible, and of how it can be adjusted to the patients after plastic repair of the lower jaw. The prosthesis is as self-retaining as full lower dentures and, in addition to aiding restoration of masticatory and expressive functions, allows the patient to talk satisfactorily. (R.G.)

674. ESTVAN, F. J., Studies in social perception: word productivity. *J. exper. Educ.*, 28, 1959, 37-63.

Eighty-eight first- and sixth-grade boys and girls from urban and one-room public schools were asked to respond to 14 pictures, were subsequently interviewed and given the Binet. Word Productivity, i.e., number of words in response to the pictures, was not significantly correlated with IQ, MA, Vocabulary score, or Word Fluency score. When only the high and low IQ groups were compared, the high group was significantly higher in Word Production. Productivity of urban and rural groups was not significantly different. Sixth graders were more productive than first graders; sixth graders and the high-intelligence group were most productive on the adult and remote-experiences pictures, whereas the first graders and the low-intelligence group were most productive on the child-experience pictures. (*Child Development Abst. Bibl.*)

675. FRISINA, D. R., Statistical information concerning the deaf and hard of hearing in the United States. *Amer. Ann. Deaf*, 104, 1959, 265-270.

Breakdowns on the 2.5 million hypacusis in the United States are provided for the deaf and for the hard of hearing (both by sex and age): frequencies and types of educational facilities, distribution of speech and hearing clinics, kinds and distribution of school-age multiple handicapped. (*Psychol. Abstr.*)

676. GARRISON, K. C., and FORCE, D. G., Jr., *The Psychology of Exceptional Children*. (3rd Ed.) New York: Ronald Press, 1959. 592 p.

This book is designed as a textbook for teachers-in-training and teachers-in-service. It aims to give the classroom teacher an overview of the nature, incidence, identification, and education of children who deviate sufficiently from the average to require special education. The third edition includes in its discussion the significant developments in special education which have taken place since the previous editions were published. These developments involve greatly expanded services, increased public awareness, and a refinement in methods of dealing with exceptional children. New chapters on epilepsy, cerebral palsy, and cardiac conditions have been brought up-to-date. One of the strong points of the book is the authors' awareness of the importance of how the exceptional child feels about himself and how he reacts to the responses of other towards him. Emphasis is placed on viewing the child as a whole rather than a multiplicity of parts or as a child with a specific handicap. (*Child Development Abst. Bibl.*)

677. GELDARD, F. A., Some neglected possibilities of communication. *Science*, 131 (3413), 1960, 1583-1587.

The skin is discussed as a possible valuable supplement to ears and eyes. Relevant contemporary research is reviewed and some of the kinds of things it would be important to know for further investigations are discussed. (F.R.)

678. HILL, I. N., BLAYNEY, J. R., and WOLF, W., The Evanston dental caries study. XIX. Prevalence of malocclusion of children in a fluoridated and control area. *J. dent. Res.*, 38, 1959, 782-794.

Data gathered in children 6 to 8 and 12 to 14 years of age; examinations divided into pre-fluoride, fluoride, and fluoride-free groups. Frequency of malocclusion in 6 to 8 year group after 8 years fluoridation was 20.48% less than pre-fluoride base-line of 6 to 8 year children. The 12 to 14 year group, after 10 years fluoridation, similarly showed 17.03% decrease in malocclusion. Prevalence malocclusion in fluoride area in 1955 and 1957 was about same as in 1956 control area. In a 9-year period control area showed increase of malocclusion of 11.76% in 6 to 8 group, 7.84% in 12 to 14 group. The authors conclude: 'From

our observations of the data available at this time, we feel that no definitive statement can be made regarding fluoridation and its effect on the prevalence of malocclusion.' (*Child Developmt Abst. Bibl.*)

679. HUDSON, A., Communication problems of the geriatric patient. *J. speech hear. Dis.*, 25, 1960, 238-248.

Although further research relative to the incidence of communication problems in the aged is needed, the literature reviewed by the author indicates that a relatively large section of the 15 million individuals over 65 years of age are communicatively handicapped. The major problems mentioned are hearing impairment, aphasia, dysarthria of central or peripheral nervous system origin, dysphonia due to serious neuropathologies, and the loss of voice due to laryngectomy. The tendency for multiple defect in the same individual is noted. The author calls attention to the importance for the aged of speech intelligibility and adequate language understanding, both as facilitators of medical treatment and home management and as major sources of enjoyment during later years. Her review of the literature indicates that multidisciplinary planning and training, which is best provided by comprehensive rehabilitation centers, can benefit older patients. The communication specialist can serve many purposes: providing evaluation and training, (direct services), and/or modifying the patient's environment (indirect services). Applications are made of the results of research regarding the problems of the aging to the evaluation and treatment of geriatric communication problems. Members of the American Speech and Hearing Association are urged to engage in studying the processes of aging. (*S.J.G.*)

680. KASTEIN, S., Differential diagnosis in children with communication disorders; a film demonstration by Shulamith Kastein and Edmund P. Fowler, Jr. *Trans. Amer. Acad. Ophtholmol. Otolaryngol.*, 64(4), 1960, 529-539.

An increasing number of children with central nervous system impairments come to the attention of the otolaryngologist. Profiles of six children representing different diagnostic entities in such patients are presented. Children from St. Joseph's

School for the Deaf were selected for cinematographic study; staff members of Columbia-Presbyterian Medical Center are cooperating in the project. The film demonstrates modes of behavior, attitudes toward verbal communication, and test responses characteristic of each pathologic profile. (*Rehab. Lit.*)

681. KLOEPEL, J., Kieferorthopädische Massnahmen als Ergänzung hals-, nasen-, ohrenärztlicher Therapie. (Orthopedic procedures for the jaw as a complement of throat, nose, and ear treatment.) *HNO*, Berlin, 8, 1960, 360-364.

The writer emphasizes two problems: (1) Does mouth breathing produce malformation of the jaw or is the opposite true? (2) Does mouth breathing produce an enlargement of the third tonsil or is mouth breathing the consequence of the enlargement? The fact that mouth breathers frequently show a prognate maxilla and a receding mandible led to the opinion that the type of breathing accounted for the anatomic deviations. However, today we note that the size and shape of both jaws and of the nose are to a great extent inherited. On the other hand the lateral pressure of the cheek muscles in a case of a constantly opened mouth might also have an unfavorable influence on the shape of the maxilla. An abnormally narrow nose can, of course, favor mouth breathing. An enlargement of the third tonsil as a consequence of mouth breathing is most improbable. Mouth breathing can produce pharyngitis by drying out the inhaled air. The otorhinological work should in some cases be completed by jaw orthopedy by expanding the suture of the maxilla. The painless method is described and in two cases the results are given especially emphasizing the cessation of colds. Some mouth breathers do not close the lips even after adenoidectomy. Orthopedic procedures with a certain kind of training exercises for the jaw are recommended. (*E.F.*)

682. LLARDENT, R. V., El síndrome de la hipoacusia escolar inadvertida. (Syndrome of undetected deafness in the schools.) *Acta oto-rino-laringol. Ibero-Amer.*, 11, 1960, 218-246.

The author examines the consequences which may derive from the oversight of

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deafness among schoolboys, gathering these cases in what he denominates as 'syndrome of inadvertent school deafness,' observing with some accuracy every one of these four fundamental symptoms: a moderate intensity deafness; inadvertence of it by the parents, educators, and the child himself; temper troubles; and backwardness in studies. He surveys the literature on the matter, bringing in acquired experience through over 10,000 collective audiograms (1,100 with the M.H.T. and 9,035 with tonal-sweeping) carried out from 1952 until now. In the school term 1958-59 he found an incidence of 1.5% of undetected deafness. Above all, he insists on prophylactic social work. (*Author's précis*)

683. LUNA AEDO, C. M., *Hipoacusia en medio escolar.* (Hyperacusia among school children.) *Rev. Otorrinolaringol.*, Santiago, 20(1), 1960, 13-18.

(1) The author examined 452 school children and found 7.5% hard of hearing. (2) Of the 34 hard-of-hearing school children, 10 cases (29%) do not need any treatment; 16 cases (47%) need medical surgery treatment, and 12 cases (35%) need special instruction. (3) The author reviewed the pathology of Lymphatic Waldeyer Ring, there is no significant statistical difference between the percentage of mouth breathers among the hard of hearing school children and among normal hearing school children. In the same way, there is no difference between the percentage of diagnosis frequency of adenoid and chronic tonsilitis. (4) There is a greater percentage of tonsilectomy and adenoid-tonsilectomy among the hard of hearing school children of the middle ears than the percentage that the author found among the normal hearing school children. This difference is statistically significant. (5) The author compared the frequency of adenoid-tonsilectomy in the school children of Chile and of foreign countries, and found it to be much higher in the latter. (6) The author discusses the probable influence of the tonsils and adenoids on otitis media and on hearing. (7) In the last point, the author examined 82 mouth breathers among 418 normal hearing school children, and presents the findings from examination of the nose and pharynx. (*Author's summary*)

684. MOSER, H. M., O'NEILL, J. J., OYER, H. J., WOLFE, S. M., and SCHOWE, B. M., Jr., *Hand signals for aviation.* *Ohio State Univ. Res. Foundation*, TR 51, Sep 1958, (AFCRC TN 58-57) ASTIA Doc. No. 160705.

This report is essentially a collection and preliminary survey of hand signals used by flight-line personnel. Modifications of these signs, new signs, and variations on the signs by a deaf man are also shown in photographs. (*J.C.W.*)

685. MOSER, H. M., O'NEILL, J. J., OYER, H. J., WOLFE, S. M., ABERNATHY, E. R., and SCHOWE, B. M., Jr., *Hand signals: finger-spelling.* *Ohio State Univ. Res. Foundation*, TR 49, August 1958 (AFCRC TR 58-56) ASTIA Doc. No. 152648.

Can the finger-spelling alphabet of the deaf be used as a medium of communication in high-level noise? Twenty-four deaf students were used as subjects for the intelligibility testing of nonmeaningful alphabet triplets under conditions of artificial lighting and natural lighting. The intelligibility of alphabet letters was high enough at distances of 175 feet to indicate possibilities of using the finger-spelling alphabet as a means of supplementing or clarifying hand signals now in use. (*J.C.W.*)

686. MUSSAFIA, M., *Le rôle de l'hérédité dans les troubles du langage.* (The role of inheritance in language and speech problems.) *Folia Phoniat.*, Basel, 12, 1960, 94-100.

The family histories of 692 patients are examined. The presence in the history of patterns of psychoneurosis, consanguinity, alcoholism, and the report of family speech or language disturbance is noted. For the sample population 52% of the dysphasic group are noted to have family histories of prior disturbance. The range of association for inheritance was from a 52% high for dysphasia to a 2% low for phonasthenia. Speech and language disabilities considered are dyslalies, rhinolalias, delay, mutism, and others. Inheritance is a factor in varying degree for speech and language disturbances. The observations reported confirm the notations of the previous literature. (*J.B.R.*)

687. MYERS, D., What parents should know about deafness. *Today's Health*, 38, 44-45.

The author answers a series of specific questions about the nature of deafness in regard to the medical, social, and educative implications. He discusses early detection and symptomatology, etiology, and the parents role in the child's habilitation. (E.H.N.)

688. NORKUS, F. J., DERBYSHIRE, A. J., MILLS, P. J., and CARTER, R. L., Frequency measure of the EEG. *J. acoust. Soc. Amer.*, 32, 1960, 1147-1150.

The EEG pattern in a sleeping subject is shown to reveal a change in the normal curve very shortly after introduction of a moderately loud pure tone. The delay in response is seen as an inverse function of the loudness of the tone. This method of objective audiometry requires much skill on the part of the operators, but shows promise as a clinical tool. (B.A.L.)

689. NORRIS, M. J., A list of descriptions of present-day languages. *Language Learning*, 10(1, 2), 1960, 67-88.

This list is of articles concerned with seventy-four languages which have appeared in all volumes of *Language*, 1925 through 1959; *Word*, 1945 through 1959; and *Language Learning*, 1948 through 1959. (F.R.)

690. SEGER, G. H., Opportunities for research and research training in the field of hearing. *Trans. Amer. Acad. Ophthalmol. Otolaryngol.*, 54, 1960, 524-528.

The author reviews the magnitude and nature of the public health problem which led to the establishment of the National Institute of Neurological Diseases and Blindness in 1950, the progress made in the last nine years, and points out opportunities for additional training, particularly in the field of hearing. Neurological and sensory diseases affect well over 20,000,000 people in the U. S., of whom at least one half endure gravely disabling conditions. As a cause of death, neurological diseases rank third. However, it is as the primary cause of permanent impairment that neurological and sensory disorders are generally recognized. For example, cerebrovascular disease accounting for about 200,000 deaths an-

nually also results in over 2,000,000 persons paralyzed in body or seriously limited in powers of movement, speech, and vision. Other neurological and sensory disorders, similarly affecting the brain or spinal cord, are responsible for the disablement of an estimated additional 10,000,000 persons annually. No other group of disorders receives so little medical or research attention; yet no other group represents such a staggering economic loss to the nation, to the patients, and to the families that must cope with them. The first appropriation the National Congress made to the Institute for research in the field of neurological and sensory disease was for the fiscal year 1952 and amounted to \$1,015,000. This sufficed to support 119 research projects, none of which was in the hearing and speech field. By 1955 the Congress had increased the budget for research grants to \$4,000,000. In that year the Institute supported 17 projects in the hearing and speech field in the amount of \$175,000, which represented about 4.4 per cent of the budget. At a conference of leading authorities in the hearing and speech field it was concluded that, for all practical purposes, this research field, personnel-wise, was almost bankrupt. Subsequently, the Otolaryngology Postgraduate Training Committee was established to advise the Institute on the training of additional clinical and basic science research manpower. At present, support is given to 74 projects in the hearing and speech field, involving a little over \$1.3 million per annum and comprising 6.6 per cent of the budget. Research horizons in the hearing and speech field are broadening and financial backing is readily available to those who can present a proposal that seems to have potential for making a contribution. Through a combination support derived from research grants, training grants, and individual awards, the Institute can aid in the carrying out of research and in developing outstanding investigators in the field of sensory disease. (M.H.M.)

691. SEIDE, L. J., The relationship of dentofacial growth and skeletal maturation to malocclusion. *Amer. J. Orthodont.*, 45, 1959, 801-816.

Skeletal age in orthodontic patients was determined by use of the Greulich and Pyle 'Atlas' (1950 ed.). Two case histories

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are presented, and a comparison between bone age and X-ray cephalometric analysis is offered. The author concludes that 'the proper assessment of skeletal maturation is a positive factor in dentofacial growth and development and cannot be separated from dentofacial growth.' A complete medical, dental, genetic history should be secured to assay the effect of exogenous factors. In planning orthodontic treatment, skeletal maturation and dentofacial growth should be carefully evaluated, in terms of extent or degree of deviation from the norm. (*Child Development Abst. Bibl.*)

692. SIEVERS, D. J., A study to compare the performance of brain-injured and non-brain-injured mentally retarded children on the Differential Language Facility Test. *Amer. J. ment. Def.*, 63, 1959, 839-847.

Differences in language skills were compared among 30 retarded brain-injured, 33 retarded non-brain-injured, and 100 normal children. For all subjects Stanford-Binet MA scores ranged from 2-0 to 5-11. Comparisons were made on the Differential Language Facility Test, which was developed from Osgood's theory of communication, consisting of 11 subtests in such areas as labeling, speech mimicry, gestural conversation, etc. In general, it was found that normals tended to be superior to brain-injured children in over-all language ability, this difference increasing with MA, and were higher than both other groups on subtests requiring expression without semantic meaning. The retarded non-brain-injured were higher than brain-injured on subtests involving making semantic connections between visual objects. (*Child Development Abst. Bibl.*)

693. U.S. OFFICE OF EDUCATION, Professional preparation for teachers of exceptional children; an overview; a report based on findings from the study 'Qualifications and preparation of teachers of exceptional children,' prepared by Romaine P. Mackie (and others). Washington, D.C. Govt Print. Off., 1960, 139 p. illus., graphs, tabs. (Bul. 1959, no. 6)

The eleventh in the series of bulletins based on the nationwide study begun in 1952 by the Office of Education, it differs from previous specialized reports in trac-

ing central issues of the 10 areas of exceptionality. Facts and opinion data on teacher competencies in all areas, on the professional preparation of such teachers, and on their inservice education are re-examined. The information on qualifications and preparation needed by college staff members is published here for the first time and in considerable detail. Implications of the findings for future planning and for developing and improving professional standards are discussed briefly in the summary. Available from U. S. Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 45 cents a copy. (*Rehab. Lit.*)

694. WEVER, E. G., and VERNON, J. A., The problem of hearing in snakes. *J. aud. Res.*, 1, 1960, 77-83.

The hearing of some common species of snakes was studied by the cochlear potential method. The results do not support the generally accepted view that these animals are deaf to aerial sounds, but indicate instead a narrow limitation in range. For the low tones between 100 and 700 cps. the snakes are moderately sensitive both by air and bone conduction. In this low range the absence of an external ear and the use of the quadrate bone instead of the tympanic membrane as a sound receiving surface is not a serious handicap. (*Authors' summary*)

695. WOODS, SISTER F. J., and CARROW, SISTER M. A., The choice-rejection status of speech-defective children. *Except. Child.*, 25, 1959, 279-283.

A study of the social acceptance of speech-defective children was made by comparing the choice-rejection scores of 96 speech-defective children with their 1428 peers in grades 2, 3, 4, and 5. The speech-defectives were found to have choice-rejection scores significantly lower than the non-speech defective on the criteria of play and friendship, but not on that of work. Within the speech defective group there were no significant differences between the sexes, or degrees of severity of problem. Stutterers were found to be significantly better accepted than articulatory defectives. (*Authors' summary*)

SOURCES OF ABSTRACTS

Most of the material for DSH Abstracts is obtained from two sources: (1) from direct abstracting of articles in professional journals, and (2) from other abstracting services. The following list contains the names and addresses of the sources from which abstracts are obtained.

1. Journals

Acta Audiologica y Foniátrica
Hispano-Americana
Institute Mexicano de la Audición
y el Lenguaje
Avenida Progreso 141 "A"
Mexico City, Mexico 18, D.F.

Acta Linguistica
Postafok 440
Budapest 62, Hungary

Acta Oto-Laryngologica
Kr. 60 Karlavagan 41
Stockholm O., Sweden

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Belgica

43 Rue des Champs-Elysees
Brussels 5, Belgium

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Ibero-Americana
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Provenza 319
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Acta Otorrinolaringológica
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Villanueva, 11
Madrid, Spain

Acta Psychiatrica et Neurologica
Scandinavica
Nørregade 6
Copenhagen K, Denmark

Acustica
DM 60.
S. Hirzel,
Stuttgart, Germany

Akusticheski Zhurnal
Moscow B-64, U.S.S.R.

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and Psychiatry
535 N. Dearborn Street
Chicago 10, Illinois

A.M.A. Archives of Otolaryngology
535 N. Dearborn Street
Chicago 10, Illinois

A.M.A. Journal of Diseases of
Children
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Gallaudet College
Washington 2, D.C.

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Box 1494
University, Alabama

American Journal of Human
Genetics
Mount Royal and Guilford Avenues
Baltimore 2, Maryland

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Deficiency
P.O. Box 191
Pineville, Louisiana

American Journal of Nursing
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New York 19, N.Y.

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Health and the Nation's Health
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American Journal of Surgery
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Wistar Institute of Anatomy and
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Annales d'Oto-Laryngologie
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Paris 6, France

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Annals of Otolaryngology,
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Box 1345
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Capob
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Carte
Castro
Cawth
Chesn
Choch
Clark
Cobet
Cody
Cole
Coles
Cox, J
Craig
Creel
Crich
Cruz,

AUTHOR INDEX

(Figures Refer to Abstract Numbers)

- Abernathy, E. R., 685
Abramson, A. S., 573
Ades, H. W., 372
Adler, S., 557, 648
Ahrens, R., 597
Allen, F., 412
Alpers, B. J., 442
Altman, L. A., 666
Anderson, F., 496
Andr sen, E. S., 561
Archer, M., 582
Ardissone, E. T. (h.), 488
Arvieri, W., 443
Azrin, N. H., 651, 667
- Bach, E., 444
Bambha, J. K., 668
Barber, C. G., 598
Bareladze, P. L., 406
Barger, W. C., 598
Barroilhet, J., 641
Bartlett, F., 512
Beard, C. A., 403
Beck, J., 656
Beckmann, G., 445
Beer, B., 354
Berger, F., 642
Berger, M., 534
Berkhouse, R. G., 583
Berko, J., 603
Bernadine, Sr. A., 497
Bilger, R. C., 350
Black, A. D., 584
Black, J. W., 498, 550, 554, 562, 566, 585
Blayne, J. R., 678
Blocker, T. G., Jr., 620
Blocker, V., 620
Bloodstein, O., 649
B hme, G., 643
Bombelli, U., 373
Borel-Maisonny, S., 563
Boriani, V. A., 446
Bosches, B., 606
Bosma, J. F., 546, 625
Brajna, S., 621
Brill, R. G., 513
Brockman, S. J., 374
Brown, W. J., 489
Brumlik, J., 664
Brunet, O., 586
Brunetti, F., 535
Bruno, G., 594
Bruten, M., 375
Buey, P. C., 409
Burian, F., 622
Buysens, E., 564
Bzoch, K. R., 623
- Cabral, G. P., 499
Calvert, J., 447
Campbell, R. N., 587
Cantor, G. N., 669
Capella, G., 448
Capobianco, R., 590
Carrow, Sr. M. A., 695
Carter, R. L., 688
Castro, G., 448
Cawthorne, T., 514
Chesni, P. Y., 552
Chocholle, R., 355, 376, 377
Clark, R., 670
Cobet, H., 671
Cody, D. T. R., 449
Cole, R., 413
Coles, R. R. A., 388
Cox, J. R., Jr., 350
Craig, J. H., 356
Creelman, C. D., 357
Critchley, M., 599
Cruz, R., 632
- Cubert, C., 495
Curry, A., 414
Curry, E. T., 555
Curtis, E., 624
Curtis, W. S., 653
- Damat , P. H., 657
De Ardissone, M. B., 488
De Quiros, J. B., 658
Derbyshire, A. J., 688
Derks, A. C. W., 483
De Santis, M., 650
De Sebastian, G., 378
Desmond, T., 644
Desreets, M. S., 565
De Wit, C. A., 379
Di Carlo, L. M., 489
Dickson, E. D. D., 672
Di Girolamo, A., 545
Dirks, D., 351
Doctor, P. V., 509
Doehring, D. G., 515, 600
Dohman, G., 337
Douglass, E., 602
Dowdina, M., 394, 504
Draper, I. T., 601
Draper, M. H., 536
Dreher, J. J., 532
Dudok, 379
Dunn, L. M., 609
Durlach, N. I., 358
Dyachkov, A., 415
- Ebihara, I., 450
Eckert-Mobius, A., 671
Eijkman, E., 359
Eisler, H., 360
Ek, J., 361
Ekman, G., 360
Elser, R. P., 521
Englebrecht, G. K., 527, 528
Erich, J. B., 673
Estvan, F. J., 674
Evoy, M. H., 537
Ewing, A. W. G., 404, 416, 417
- Farrant, R. H., 380
Fay, T. H., Jr., 555
Fein, A., 390
Ferguson, C., 534
Fernandez, C., 338
Fillenbaum, S., 604
Fink, B. R., 538
Flori-Ratti, L., 594
Flanagan, B., 651
Fletcher, S., 625
Force, D. G., Jr., 676
Fotheringham, W. C., 558
Fowler, E. P., 451, 490
Fraser, C., 495
Freeman, M. S., 452
Freeman, R. J., 452
French, J. L., 516
French, S. L., 522
Frenk, S., 641
Frisira, D. R., 675
Fritzell, B., 626
- Galambos, R., 347
Gallaudet College, 529, 530
Garc a Ib nez, L., 453
Garde, E., 659
Gardner, R. C., 588
Garrison, K. C., 676
Gaskill, P., 523
Gedda, L., 594
Geldard, F. A., 677
Gemelli, A., 566
Gerstman, L. J., 573
Girardeau, F. L., 669
Gisselsson, L., 339
Glorig, A., 408
- Godfrey, C. M., 602
Goetzinger, C. P., 351
Goldiamond, I., 651
Goldstein, R., 381, 397, 605
Goodglass, H., 603
Goodhill, V., 454
Graybiel, A., 372
Green, P. B., 418
Green, R. I., 627
Greene, M. C., 640
Grinder, R. E., 584
Guilford, F. R., 457
- Haggerty, A. D., 589
Hahlbrock, K. H., 455
Halfond, M. M., 630
Hallberg, O. E., 456
Hamp, E. P., 567
Harley, R. K., 609
Harris, D. B., 517
Harris, G. G., 362
Harris, J. D., 367
Haskins, R., 625
Hass, W., 645
Hayden, G. D., 491
Hendry, J., 534
Henner, R., 457
Hess, D. A., 628
Heys, A. E., 524
Hill, I. N., 678
Hinchcliffe, R., 382
Hirt, C. C., 595
Hjorth, S., 458
Hladky, R., 459
Hockett, C. F., 568, 569
Hoffman, I. L., 401
Holmgren, B., 641
Hood, J. D., 383
Hormia, A., 407
Hoshiko, M. S., 539
House, W. F., 408
Hoversten, G. H., 374
Hub cek, J., 460
Hudson, A., 679
Huizinga, E., 657
Husson, R., 540
Hutton, C. L., 419, 555
Hyb sek, I., 460
- Ikeda, H., 450
Ingall, B. I., 492, 500
Ingemann, F., 573
Iodice, S., 384
Irwin, O. C., 610, 611, 612, 613
Irwin, R., 570
Ivanov, N. I., 340
- Jeanet, C., 457
Jeffers, J., 493
Jeffress, L. A., 356
Jerger, J. F., 385, 396, 409
Johnson, G. O., 590
Jolly, F., 420
Jones, J. P., 421
Jongkees, L. B. W., 361
Juers, A. L., 461
Julich, H., 671
- Kamienski, R., 621
Kanadani, M., 387
Kastein, S., 680
Keats, S., 614
Kelemen, G., 462
Kietz, H., 341
Kirkpatrick, J. A., 630
Kirschner, F., 538
Kieffner, F. R., 605
Kley, W., 463, 487
Klijn, J., 361
Kloepfel, J., 681
Klotz, P. L., 422
Knight, J. J., 388

- Knight, J. S., 660
 Knox, E. C., 389
 Kodman, F., Jr., 390, 525
 Korsunskaya, B., 426
 Kostlin, A., 487
 Kotyza, F., 464
 Kovář, M., 465
 Kramer, J. C., 381
 Kramsky, J., 571
 Krč, C., 460
 Krmpotić, P. J., 541
 Kryter, K. D., 556
 Ladefoged, P., 536
 Lambert, W. E., 588, 604
 Landau, W. M., 605
 Lane, H. S., 526
 Lawrence, M., 473
 Leenhouts, M. A., 510
 Legouis, J. P., 342, 343
 Lehtste, L., 572, 579
 Leshin, G., 518
 Li Huatsh, 548
 Lindsay, J. R., 466
 Llardent, R. V., 682
 Loeb, M., 363
 Lotz, J., 573
 Love, P. E., 519
 Lovo, G. F., 446
 Lubin, B., 615
 Luchsinger, P., 574
 Lumaden, J., 423
 Luna Aedo, C. M., 683
 Lundborg, T., 458
 Lux, E., 393
 MacClure, J. S. R., 344
 Malécot, A., 575
 Manfredi, A., 373
 Manson-Hing, L. R., 542
 Martin, R. K., 424
 Masura, S., 661
 McCauley, J. M., 495
 McConnell, F., 494
 McDonald, D., 494
 McDonald, E. T., 628
 McGee, T. M., 476
 Mecham, M. J., 616
 Mehmke, S., 345, 391
 Meisnma, G. L., 576
 Menšíková, Z., 464
 Meyer, M. F., 346, 364
 Miller, A. A., 495
 Miller, D., 590
 Mills, J., 425
 Mills, P. J., 688
 Milojevic, B., 543
 Mitchell, R. G., 617
 Mitrinowicz-Modrzejewska, V. A., 629
 Mitrinowicz-Modrzejewska, A., 392
 Mitrovic, P. M., 543
 Mixson, A., 390
 Modica, V., 467
 Moll, K. L., 544
 Moore, P., 664
 Morkovin, B. V., 501
 Morley, M. E., 608
 Morozova, N., 426
 Morrill, S. N., 372
 Moser, H. M., 532, 557, 558, 684
 Moses, P. J., 662
 Mussafia, M., 686
 Myers, D., 468, 687
 Myklebust, H. R., 520, 606
 Naudin, M.-J., 427
 Neiger, M., 469
 Nelson, M., 502
 Nemer, W. J., 573
 Newman, E. B., 577
 Nikitina, V. F., 470
 Norkus, F. J., 688
 Norris, M. J., 689
 Norton, M. C., 393
 Ockel, H. H., 652
 Oleksiuk, S., 476
 Olmstead, R. W., 630
 Olarn, N. H., 631
 O'Neill, J. J., 532, 557, 558, 684
 Orsini, F., 365
 Ortiz-Monasterio, F., 632
 Owens, P. E., 428
 Owrid, H. L., 503
 Oyer, H. J., 394, 504, 532, 558, 684
 Palasek, J. R., 653
 Paludetti, G., 545
 Perello, J., 366, 633
 Perone, P., 663
 Peterson, G. E., 578, 579
 Pikler, A. G., 367
 Pirruccello, F. W., 634
 Polák, O., 465
 Polish, E., 670
 Pollack, L., 368
 Ponicki, F., III, 621
 Proctor, L. R., 466
 Pursglove, T., 429
 Raph, J. D., 505
 Rauch, S., 487
 Reinecken, R., 410
 Reitan, R. M., 600
 Ribet, A., 447
 Richtner, N. G., 471
 Riesen-MacClure, J. S., 472
 Riopelle, A. J., 363
 Ritter, F. N., 473
 Rittmanic, P. A., 405
 Robe, E., 664
 Rosen, M. S., 635
 Rosenberg, C. M., 592
 Rosenstein, S. W., 636
 Rosler, G., 458
 Rousey, C. L., 351
 Rubin, H., 395
 Rubin, H. J., 595
 Rüedi, L., 474
 Rupert, A., 347
 Sabo, J., 430
 Sakurabayashi, H., 352
 Salonna, F., 396
 Sampson, O. C., 591
 Sa Teng-San, 543
 Sato, Y., 352
 Schnefer, E., 369
 Schilling, A., 654
 Schlosser, W. D., 468
 Schneider, H.-G., 643
 Schoenfeld, S., 397
 Schönhärl, E., 656
 Schowe, B. M., Jr., 684
 Shuknecht, H. F., 475, 476
 Schulz, E., 398
 Schuth, D. M. H., 379
 Schwehn, D. B., 431
 Sciuto, G., 665
 Sedlacek, G., 525
 Seger, G. H., 690
 Seide, L. J., 691
 Serrano, R. A., 632
 Seymour, C. J., 411
 Shen, J. J., 457
 Sheehy, J. L., 477
 Sheets, B. V., 546
 Shelton, R. L., Jr., 546
 Shere, M. O., 511
 Sievers, D. J., 592, 692
 Silber, E. F., 494
 Simmons, F. B., 347
 Siroky, J., 646
 Sisatky, D. P. y F., 658
 Smith, B. G., 432
 Society of Teachers of the Deaf, 433
 Sokhin, F. A., 593
 Spensson, B., 547
 Sørensen, H., 339, 348
 Spies, C., 525
 Stenfer, G. R., 399
 Sterling, H. M., 618
 Sternberg, J. J., 583
 Stockell, K., 525
 Stokoe, W. C., Jr., 506
 Stroud, M. H., 472
 Stuteville, O. H., 637
 Sullivan, J. A., 478
 Szpunar, J., 479
 Tabb, H. G., 480
 Tait, R. V., 647
 Tait, V., 647
 Takayasu, S., 450
 Tanner, W. F., Jr., 370
 Tarnóczy, T., 533
 Taylor, I. G., 353
 Thompson, R. F., 349
 Tolhurst, G. C., 372, 551, 559, 560
 Tolstov, Y. P., 481
 Tonndorf, J., 475
 Tormakh, E., 658
 Triandis, H., 580
 Trojan, V. F., 581, 596
 Trotter, W. R., 482
 U. S. Office of Education, 693
 U. S. Veterans Administration, 400
 Uehara, E., 352
 Urabe, K., 549
 Valderrama, M., 632
 Valenstein, E. S., 354
 Van Dishoeck, H. A. E., 483
 Van Gelder, G., 576
 Van Natta, P., 668
 Van Thal, J. H., 607
 Van Uden, A., 417
 Vendrik, A. J. H., 359
 Vernon, J. A., 694
 Vesell, E. S., 484
 Vila, P. A., 485
 Viladiu, J. M., 485
 Vito-Massei, P., 467
 Voorhorst, R., 483
 Wallace, H. M., 434, 619
 Walter, Sr. M., 435
 Wang, J., 553
 Weber, I., 486
 Westlake, H., 638
 West, E. G., 694
 White, O. L., 531
 Whitteridge, D., 536
 Wilkinson, W., 436
 Williams, H. G., 437, 438, 439, 507
 Williams, H. L., 449
 Willis, H. S. K., 401
 Wilmot, T. J., 411
 Winchester, R. A., 468
 Wolf, A. A., 655
 Wolf, E. G., 655
 Wolf, W., 678
 Wolfe, S. M., 558, 684
 Wood, W. E., 440
 Woodford, D., 441
 Woods Sr. F. J., 695
 Woods, I. A., 583
 Woodward, M. F., 508
 Work, W. P., 466
 Wullstein, H. L., 487
 Wu Shao-Ch'ing, 548
 Wustrow, F., 639
 Yamashita, T., 549
 Zaoli, G., 402
 Zwislowski, J., 371





